THE
PEDAGOGICAL SEMINARY
Founded and Edited by G. Stanley Hall

Vol. XXI MARCH, 1914 No. 1

HOME ECONOMICS

By Ellen Cope, Wellesley, Mass.

I. The Home Economics Movement

If we look back to discover when and how this now well established movement had its beginning, we find that so long ago as 1789, girls in the Boston Public Schools were allowed to spend some time on needlework under direction. In 1821 Mrs. Emma Willard opened a course in Household Arts in Troy Female Seminary. Lessons in cooking were given by a Professor Blot in several of the large cities in the years 1859 to 1860. In 1862 the government began to take an interest and Congress passed an Act which provided for the establishment of the so-called *Land Grant Colleges,* in which should be taught " such branches of learning as are related to agriculture and the mechanical arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." A four year course in Domestic Science was introduced into the University of Illinois in 1875-76. During the next twenty-five years departments were opened in colleges and universities, special courses were given in private schools and to the children in public schools. It is interesting to note that in 1890-91 a course in sanitation and dietetics was given at Wellesley. At the time of the last investigation by the government, some four years ago, there were over one hundred colleges and universities or other institutions of collegiate grade giving instruction in Home Economics. The largest group offering a four years' course leading to a degree were the Land Grant Colleges. Besides these there are normal schools, " secondary and high," special do-

mestic science and industrial schools, also schools for Indians and Negroes, and elementary and secondary schools. The total number of institutions in the United States known to be giving instruction in Home Economics at that time was over twelve hundred.

In addition to these schools there are correspondence schools, bulletins, magazines and clubs for the help of the housewife who cannot be away from home for special study.

The *American Home Economics Association,* organized in 1909 by Mrs. Ellen H. Richards and comprising teachers of Domestic Science, home-makers, teachers, sanitarians and economists from all over the country, is perhaps the greatest expression of the widespread interest in the subject. A world-wide association of educators from many European countries and the United States concerns itself with a closely related phase of this work. The child in the home is considered rather than the arts and sciences which make possible a suitable home. Under the name of the *IIIme Congrès International d'Education Familiale* the association held its last meeting in Brussels in August, 1910.

In an article on University Professional Schools for Women (Report of the *Congrès International*), Dr. Benjamin R. Andrews, secretary of the Schools of Household and Industrial Arts of Columbia University makes a comment, the idea of which is not infrequently expressed by thinking men of various professions:

"To-day practically every state college and university possesses co-ordinate with its professional schools for men, departments or schools of Household Science for women. Strangely enough the women's colleges (those receiving women only) have done least in introducing the special courses in Household Science and ordinarily have only the academic curricula. The curricula of these women's colleges represent an effort extending over fifty years to secure for women the same educational advantages as for men, namely, the academic collegiate courses which fifty years ago represented all of men's education. Meantime men's education has differentiated into all the professional schools. Equally, women's must now differentiate and the departments of Household Science in co-educational universities are a movement in this direction."

Upon investigation of a dozen or more catalogues of schools and universities, we find as a rule three classes of students recognized by the departments of Home Economics; (1) those who wish such training as will enable them to manage their homes more scientifically, (2) those who wish to do institutional management work in hospitals, asylums, college dormitories, lunch rooms, etc., and (3) those who wish to teach domestic science in the public schools or higher institutions of learning.

As the school of Household and Industrial Arts of Teachers College, New York, is probably the most advanced in the country, it will be taken as typical of what is best in this line of work. The curricula offered by this school are stated under these headings: Household Arts Education, Nurses Education and Health Protection, Household Administration and Dietetics, Household Decoration, Applied Arts and Special Courses. As our chief interest is in the courses which concern home-makers, the Household Arts, Household Administration and Household Decoration are the only sections which need be examined. The Nurses' Education and Health course, though not to be discussed here, has undoubtedly a value for home-makers in some of its aspects. Strangely enough, there is a course, among others, more strictly medical, which would seem quite as properly to belong in the course for Home-makers—the Care of Infants and Small Children—for which the Department of Physical Education and Kindergarten have contributed what they have of value for the students of nursing and health. These topics are discussed: The basis in physiological knowledge for the rational care of the child; the basis of early mental and moral training; the physical care of the child from the third to the sixth year,—its food, sleep, bath, clothing, habits, occupations.

The school of Household Arts "provides training for teachers of all grades in the special fields of the Arts and Sciences, including for advanced students graduate study and preparation for university and college professorships in home economics and its various divisions. Preparation is also provided for supervisors of Domestic Science and Art in public schools and heads of departments of Domestic Science and Domestic Art in Normal and Teachers' Training Schools: also professional training for teachers in secondary, grammar and elementary schools."

For the teachers of Domestic Art there are courses in General and Educational Psychology, History and Principles of Education, Theory and Practice of Teaching Domestic Art, *Applied Handwork, Textiles, Garment making, Dress making, Millinery, Household Art Design* and *Costume Design.* For teachers of Domestic Science there are General and Educational Psychology, History and Principles of Education, Theory and Practice of Teaching Domestic Science, Domestic Science for Schools, *Dietetics, Food Production, Household Chemistry, Physiological Chemistry, Experimental Cookery.*

For the supervisors of Domestic Art or Domestic Science special courses are given.

The two year curriculum in the School of Household Ad-

ministration " for professional superintendents and managers, matrons and professional housekeepers in private households and in institutional households, colleges and school dormitories, asylums, hospitals, and other large institutions, dietitians and managers in commissary departments in such institutions " offers courses in General and Educational Psychology, *House Structure, Housefitting and Sanitation, Household Management, Buying, Food Production and Manufacture, Household Chemistry, Applied Bacteriology, Food Economics, Home Cookery and Table Service,* Institutional Cookery, and *Dietaries.*

The courses offered to those preparing for professional work in house decoration are: *Art Appreciation and History of Art, History of Design, Principles of Design,* Drawing and Painting, Mechanical Drawing, Architectural Drawing, *Clay Modelling, House Decoration, Constructive Design, House Furnishing.*

We can see that this is decidedly a university Professional School, the courses being arranged for direct application to business, or for teaching, as the Pedagogy, Theory and Practice of Teaching would indicate. If the work of the home-maker and professional housekeeper are identical we have everything here that could be desired. If there is any question about a practical housekeeper being necessarily an ideal home-maker we should perhaps at once discuss the differences. Possibly in other schools less professional we may find courses planned more particularly for home-makers. Upon investigation, however, this proves not to be the case, the courses offered being very similar to those at Columbia.

Without at present defining the scope of a course for home-makers we may assume that a considerable amount of time could be well spent by the home-maker in acquiring a firm foundation through a study of the same Household Arts and Science Courses. Supposing that a girl not needing to make her living, instead of being sent to a regular women's college, goes to Columbia that she may get an education which will fit her to become an all round intelligent supervisor of her home.

The course in Household Administration requires two years, the course in Domestic Art two years, Household Decoration three. Allowing some time for work in nursing, it is likely that she could get, by choosing those courses that would be particularly beneficial to her, a thoroughly scientific preparation for home-making in the four years that she might have spent at college gaining general culture.

But as the number who go to college is so comparatively

small and the need for information in these lines greater even for those who never go to college than for those who do we must consider the case of these others also. It is very encouraging to see what excellent courses are being given to teachers who are to go out into the elementary, secondary and normal schools of the country. When we look to see what these are going to teach we see it is: Garment and Dress Making, Millinery, Household Art (Design) and Costume Design, Dietetics, Food Production, Household and Physiological Chemistry and Experimental Cookery. These are obviously decidedly valuable courses for giving the elements of education in Home Economics. Considering again the need, also the comparatively little time there is for these things in the lower schools and noting what courses are thought to be necessary for those who manage institutional or private households in a scientific way, is the present training—incidental in most cases—of the elementary and secondary schools sufficient? People need to know how to live well more than they need to know anything else. If we should plan our schools according to this belief in general, and for girls in particular, we should doubtless find that it would take careful planning to adapt courses to the needs and circumstances of the children who drop out at the various grades up to the education possible for the college woman. This would probably mean that those who drop out first would receive instruction in the most fundamental facts related to self-preservation in its many phases and the scientific management of a home. The college woman would naturally have the greatest opportunity for an all round education in Home Economics and its related topics.

Time for school education being limited as it is, evidently many of those things which we enjoy most in life will be limited to a certain class. Although this is an undemocratic proposition, surely the principles of self-preservation and of earning a livelihood are more urgently needed than the ability to appreciate great Art and Literature. We can only regret the narrowness of a life economically debarred from those pleasures and endeavor to make it the most efficient and happy within its limits. We know that it is impossible for anyone to enjoy work for which he is not prepared. If work is the greatest part of the life of some people, we could hardly do them a greater kindness than making it possible for them to enjoy their work. We think that we know what sort of education produces an all round individual, but it is perfectly clear that present conditions do not permit full development of the personality in the case of every individual.

The government has already done a great deal for free public education and it is merely a matter of time before we have excellently equipped schools for home-makers. In " The Century of the Child " Ellen Key makes a comment which comes up forcibly in this connection. She speaks of the incongruity of so much time and money being spent to prepare for the destruction of life while not a cent and hardly a thought is given to provide for the proper creation of life, referring of course to the burdensome military system of Europe and the lack of system or interest in a preparation for the home and motherhood. With the awakening interest in race deterioration and eugenics, and with practical health, marriage, and labor laws in operation, it may not be long before the states will give more attention to the training of women for their life work than they now give to the preparation of soldiers for warfare. Conditions are very different in the United States and European countries, but doubtless the same comment could be made by Ellen Key in regard to our sense of proportion. Although somewhat of a digression, it is interesting to remark that given the cost of one of our huge battleships and the cost of its maintenance for the twenty years before its final discarding, fourteen thousand young women might take a four years college course in preparation for home-making and motherhood.

But to return to the question of the education of those of college and below college grade, in the subject of Home Economics, it will doubtless be said by many that it is not right to teach women to spend so much time and thought providing food and drink and caring for a house when the pleasures of the mind are so much greater and more eternal. Shall we not rather introduce lower down the possibility of that general culture which college offers, the joy in art and literature, philosophical speculation, and of the knowledge of the evolution of the organic world, man and civilization. If something must be sacrificed why not a little less of the material and more of the spiritual?

To this suggestion we might receive three answers. One from the staunch supporters of the practical study of Home Economics, who, like Ellen Richards, believe that the great advantage of such training is in gaining control of material things which are about us and in making natural and social forces do our bidding in order that we may have time and energy to make life gracious and worth while, and the leisure for the greater pleasures. From those who believe in the higher education of girls as it is now we would have the same argument in regard to spending time disproportionately on

material things and in addition the claim that with the broader view and the intellectual power gained through the college training one is prepared in a big, general way for almost any line of work she may choose to take up after college days; and in particular it is not wise or necessary to spend time specializing on those subjects pertaining to the management of a home when one may have some entirely different line of work.

But there is another and more puzzling view to reckon with, one which is held by many farsighted people and in particular by Charlotte Perkins Gilman, who has probably given more time and thought than any other woman in America to the consideration of woman's place in the world and the relation of the home to social evolution and world-wide economics. It is her contention that the processes involved in the management of our present-day homes are extremely wasteful economically—and spiritually—and that sending girls to schools of Domestic Science to prepare them to take care of their own homes according to our present system is only increasing the trouble. Cooking, laundering, sewing should no more be done in the home than shoe making, furniture making or carpet weaving. We want to get these industries, in most cases still crudely and unscientifically done, out into the world, into the hands of co-operative, skilled labor. Then we can have true homes of peace free from the hum of the wheels of industry and the invasion of the stranger whom we allow to be closer to our lives than any friend because she works for us, and free from the constant grinding demand for money to be spent in the uneconomical maintenance of this primitively operated institution.

In reply to the first objection to special education for girls we can say that we are surely tending towards education for life, not only as regards life work as in the case of industrial and commercial training for boys and in some places the high school courses in Domestic Science for girls, but also in the general courses there seems to be an effort to make education more usable in the enjoyment of life. So then, although possibly the tendency of the time is toward specialization as early as the secondary schools we also have the cultural idea in mind and in time may acquire the proper balance, so that there is really no cause for alarm in recommending a more universal education for girls in Home Economics.

Undoubtedly the greatest problem is to be settled for the wage-earning class who may now receive, in many places, education for typewriting, stenography, bookkeeping, etc.

These, naturally, would not ask for more cultural studies but neither would they want to be sidetracked in preparing for a more remote need than the immediate one of making money, of being independent. If these could be assured that there was equal opportunity for positions they could doubtless be persuaded to specialize in Household Arts and Science. The trouble is, of course, that skilled labor is not demanded in those lines to anything like the extent that it is in business, nor does such work have the appeal that the bigger organized work of the world does. But the time is coming for this.

To the objections of the believer in the all sufficiency of the power and grasp attained through general college training we can only say that there seems to be no reason why the same breadth of view and the same power could not be acquired through a broad course in Home Economics, *i.e.*, a combination of Domestic Art and Science and the most humanitarian subjects of the regular college course.

Although the view which Mrs. Gilman holds may not be in accord with our present ideas of home life, we cannot but see in it an opportunity for greater development of the personality because of the more economic disposal of those operations which now take up so much of the life of the majority of women. Moreover, her ideals seem to be in line with the general direction of progress, scientific management, specialization, public service and more leisure for the all-round development of the individual. Biologically, we know that the organization of the highest animals is such that the whole animal is not concerned with the taking in and the digestion of food, though all of its tissues assimilate the food prepared for them by the primary organs of digestion. It is partly a question of the most wieldy size for the unit, and whether we can get as much satisfaction from large corporations as from smaller institutions. Mrs. Gilman claims that we can, though our experience is to the contrary too frequently. It is quite likely that with greater attention to the large, co-operative institutions we might obtain satisfactory results, and in that case it may be that it is wasteful to prepare the majority of women for the administration of households in which these many industries would be carried on. This would mean that instead of being confined within the four walls of the home, occupied with running the machinery of the household, the wife and mother will be free to go abroad and engage in a work adapted to her tastes and ability. With this possibility in view we realize that we have to decide whether after all there are any particular qualifications for a wife and mother. Parenthood is undoubtedly in itself an

office of responsibility great enough to require special training though we have not realized it. Since we have assumed that special school training is needed for the home-maker we will have to define the ideal home and home-maker, to be able to say what kind of education is necessary, in spite of the fact that a recent writer on the Education of Women says that "only a quack would presume in our present darkness to prescribe an authoritative course of feminine education."

II. The Ideal Home and Home-maker

We have already implied that a woman in her home must be more than a mere housekeeper, also that even though this occupation should be taken from her she would still have the peculiar office of parent to fulfill.

That the need for a new woman and a new home is not imaginary, but arises from personal observation of disorderly, uneconomically managed homes, of children unwisely and unsympathetically treated, of unloving wives and husbands, may be shown by the innumerable articles which have appeared in the magazines and papers during the last six or seven years. These articles have dealt with the subject of "Woman Peril" or race suicide through the disinclination of educated women to marry, with the "Failures of American Women" who do not realize their true sphere in life, with the Woman Movement, Woman Suffrage, Bachelors and Maids, Divorce and many other related subjects, all implying or concluding that a reformation is needed in the home and in education for the home. Over thirty years ago Herbert Spencer wrote:

> "The greatest defect in our program of education is entirely overlooked. . . . Though some care is taken to fit the youth of both sexes for society and citizenship, no care whatever is taken to fit them for the position of parents. While it is seen that for the purpose of gaining a livelihood an elaborate preparation is needed, it appears to be that that for the bringing up of children no preparation whatever is needed. . . . Is it that this responsibility is but a remote contingency On the contrary it is sure to devolve on nine out of ten. Is it that the discharge of it is easy? Certainly not; of all functions which the adult has to fulfill, this is the most difficult. Is it that each may be trusted by self-instruction to fit himself or herself, for the office of parent? No, not only is the need for such self-instruction unrecognized but the complexity of the subject renders it the one of all others in which self-instruction is least likely to succeed."

To-day George Elliott Howard, Professor of Political Science and Sociology in the University of Nebraska, discussing America's unique divorce record, the causes of divorce,

its dark and bright side, and the ineffectiveness of laws for curing the trouble, says in conclusion:[1]

"Truly it is needful that the church and the school should join hands in providing a remedy for the social evils that cause divorce. That remedy is not more stringent law but saner education. The salvation of the family depends mainly upon a more efficient moral, social and physical training of the young. The family and its cognate institutions must find a larger place in the educational program. . . . Let us see to it that the new program be broad enough to embrace the whole many sided problem of sex, marriage and the family."

In a recent number of the Progress Magazine, in the Editor's Personal Department, there appeared a rhapsodized version of the whole matter. In spite of its possibly too poetic tone, it appeals to one as containing truth. Real reformers usually believe so warmly in their theories as to think their adoption would mean the salvation of the world. This man has found a new vocation for women, a new field for their labors.

"A field so vast as to be practically inexhaustible, a field that can promise greater reward and greater satisfaction than almost anything else that woman would care to do and yet it is a field that remains practically untouched.

"This new field is the field of the ideal home and to create an ideal home is the new work suggested for feminine genius. It is a work that requires feminine genius and the greatest feminine genius and the time for such work is now at hand. The new age into which we have entered demands the ideal home and the woman who can create such a home will accomplish far more than if she had written a thousand books or brought the whole world to her feet by the magic and art of her song.

"If you would become truly famous, if you would have your name proclaimed from the housetops, if you would enter the largest most productive field that is open to feminine genius or any genius, and if you would have your work produce greater good and greater happiness to the world than almost anything else you could do, create an ideal home.

"There is no field where there is room for so much originality, for so much talent of high order, for so much rich and superior thought, for so much actual and practical ability and for so much of that finer creative power that the feminine mind alone has the privilege to possess.

"If ten thousand women should begin to-day with this object in view—to create an ideal home—and if they all should proceed along original lines taking one or two years for the perfecting of their first creation, can anyone imagine what would happen in the home life of the world during the five years following? . . . There is one thing that we will mention and it is this. These ten thousand women would have placed in action a greater civilizing force than the world has ever seen.

---

[1] George Elliott Howard. "Divorce and Public Welfare." *McClure's,* Dec., 1909, p. 242.

"It is the home life that determines the standard and the quality of all the other phases of life. The creator of the ideal home therefore holds within her hand the secret of human destiny. She has the power to make or unmake countless generations to come."

In spite of the possibility of the correctness of Mrs. Gilman's reasoning we will assume for the present that the time has not yet come for the organization of home industries according to her prescription, and our ideal home-maker for the near future will be fashioned upon the old lines. It is not proof of what should be but possibly the reason which caused woman to undertake the agriculture for the home instead of the hunting, *i. e.*, the bearing and rearing of children may still be active in determining the proper division of labor. In connection with the discussion of whether women should have the vote or not, Madam Schumann-Heink states her conviction that no woman can be true to her home and her children if she also has a career. That not even the greater financial ability to provide for them makes up for the more necessary personal relations and care.

If we describe the ideal home-maker which we hope to create through education we shall be better able to account for the curriculum of a school planned to accomplish this end.

We would require for our ideal home-maker the education now offered by schools of Domestic Economics that there may be knowledge of the best way to do things as well as orderliness and system in the management of the home. Besides the knowledge in regard to particular operations and the power of organization, she should have such a broad view of the worth while things of life that this power would lead to a simplifying of life rather than to its complication. She would understand the true economy of time, energy and money. She would not consider it necessary to keep a servant employed at useless tasks for the sake of filling up all her time.

It has been said that men are much more interested in the scientific feeding of their horses and cows than of their children. Whether we find the plan suggested by Mrs. Gilman a workable one or not it will probably be a long time before it will be unnecessary for the mother of a family to understand the principles of dietetics and physiology. Even if she takes no part in the preparation of foods it is hardly likely that the persons to whom this work is entrusted will understand the necessity for a balanced ration; or if the work were in the hands of experts, she would still need to dictate as to what was needed by the members of her household—for no one else could be expected to have the same emotional interest in her children and husband. Through an intelligent under-

standing and application of the principles of dietetics alone she could render an inestimable service to her own family and the community at large. No amount of mental discipline or physical education can make unnecessary the having of plain nourishing food in the normal development of the individual.

"Vitality is fundamental. Without good health we cannot expect the highest mental development. Without good health and the vital conditions which produce it, we cannot expect a high morality. Without good health and the sense of well being which accompanies it, we cannot expect a deep sense of sociality or social sympathy.

"We have come now to see the fact that sociality rests upon morality, that morality is a differentiated form of mental life and mental life is conditioned upon physical life while efficient physical life depends primarily upon the food we eat."[2]

If as Laura Clarke Lockwood points out, the physiological chemists prove that the individual requires for full vital development food of certain quality and quantity to produce 2,500 to 3,000 calories of energy per day and that individual in his home through the ignorance of those who prepare and serve the food consumes a greater or less amount of innutritious food, just to that extent is the home responsible for the weakening of the vital power of the individual and the social personality.

The same writer estimates statistically that of the total number of deaths in the State of Iowa during August, 1910, 1/5 were children under one year. 80% of these were due to a disease largely preventable through hygienic means—cholera infantum. Other investigations appear to show that colds and sore throats can be controlled by diet.

We find however that nothing is sufficient in itself. At the Mental Hygiene Conference held in Boston, March and April, 1913, it was said that not even excellently prepared food would nourish a man if his surroundings, table companions, the wall paper or china were uncongenial to him. A woman who had studied in a school of Domestic Science would undoubtedly be appreciative of this fact instinctively, and possibly aside from her love of beauty and harmony would understand the psychological value of a pleasing environment both indoors and out. The psychologist tells us that we inevitably respond to our environment so as to reproduce it in some way again, and that we are subtly influenced by imperceptible lines, angles, and shadows. To say nothing of the depressing effect upon our spirits of bad art in the matter of house furnishings and costume, we become either dull to such things or come to

[2] Laura Clarke Lockwood. "Food Preparation and Its Relation to the Development of Efficient Personality in the Home." *Pop. Sci. Mo.*, Sept., 1911, p. 277.

have erroneous ideas of true beauty as a result of having continually before us violations of the principles of truth in line and color. Our final judgments and philosophy are the result of our total experiences in all lines.

The poet makes us realize the quiet influence of environment on the plastic nature of a child.[3]

"There was a child who went forth every day
And the first object he looked upon, that object he became:
And that object became part of him for the day: or a certain part of the day or for many years, or stretching cycles of years.
The early lilacs became part of this child
And grass and white and red morning glories and white and red clover and the song of the phoebe bird.
* * * * * * *
"And the apple trees covered with blossoms and the fruit afterward and woodberries and the commonest weeds by the road."

Owing to the comparatively recent interest in the subject of child study, physical education, the matter of eugenics, and the new ideas in regard to ethical marriage put in circulation by the Scandinavian writer, Ellen Key, a new responsibility devolves upon the woman who will marry.

As soon as life begins physical education should begin, and with the development of reason an appreciation of the duty of the individual to maintain as high a standard of physical efficiency as possible. After realizing that the psychical has its basis in the physical, that clear sightedness, fairness, reasonableness, attractive magnetic personality are in a very great measure due to good health, a woman should study her own physical nature to know the extent of her possibilities so that she may be reasonable in her undertakings. She must regulate or eliminate those activities which are not conducive to health in her case. Aside from matters of food, bathing, the proper balance between work, rest and play, she should understand the limit to her obligations to society, to her giving of herself to husband and children and the duty of non-conformance to convention when it interferes with the highest physical life. Undoubtedly the person radiating good health and the joy of life is a greater inspiration to her family and society than one who gives unreasonably of herself, sacrificing health and spirit in the process. We observe this frequently in the case of loving mothers and conscientious self-sacrificing teachers who wear themselves out doing for others and then lose

[3] Walt Whitman. "Leaves of Grass," p. 234.

their influence. Too often it is a case of casting pearls before swine. Though we cannot get away from the necessity of sacrifice there seems to be room for more intelligent discrimination in what is really necessary.

A far-sighted woman will realize sooner or later that she owes it not to contemporary society alone to be healthy, but to posterity. Her children have a right to be well born or to be unborn. She will choose a comrade primarily because of love, but she will understand the necessity of looking to health and character for the sake of the unborn. Knowledge of the general laws of health for herself and children would be incomplete without an understanding of the development of the child before birth and the best mode of life for the mother in order that its life may be all it should be.

If, as Ellen Key says, no children are well or legitimately born who are not the children of love, the whole subject of love and marriage will need to be philosophically gone over for the sake of the child, to say nothing of the happiness of its parents. There will be a more earnest endeavor to understand the ethical relation of this union and of the duties of parents to children and of children to parents, of wives to husbands and vice versa, and coincident with this a broader sympathy for all members of society and a respect for their rights and personalities.

Although much is said about eugenics and the importance of birth it is only one factor in the creation of a perfect personality. It is conceded even by the eugenist that the nurture of a child is fully as important as good birth. Educators here and there for many years have endeavored to make people see the need of educating very little children carefully. To-day the majority of educators are alive to this necessity and we frequently hear it emphatically stated that it is more important that primary teachers should be persons of unusual pedagogical ability and personality than the teachers in the higher grades. Consequently we require the more particular training for Kindergarten teachers whereas many college students go directly from their studies to teach in high schools and colleges without any special instruction or practice in teaching.

If we require this careful training in the case of school teachers, is there not something to be required of the mothers of children who have the education and influencing of them during the six most plastic years of life? The need for this education is becoming so clearly recognized that parents' clubs and associations are being formed in many parts of the United States, England and the Continent.

The Congrès Internationale d'Education Familiale already referred to is a world-wide association purely for the study of problems in home education. At the Third Conference of this Association held in Brussels in 1910 under the sections dealing with infancy, with family education before the school age, during the school age and afterward, such topics as the following were discussed: Study of Characteristic Faults and Tendencies of Children, The Value of Child Study by Parents' Associations, Causes of Crime in Normal Children, Justice in the Home, the Child's Natural Aptitudes and their Development with the view to choosing a career, Religious Education through the Organization of the Home, Arrangement of a Child's Room, considered from an educational point of view, Development of Initiative and Responsibility in Children, Unavoidable Short-Comings in School Education, and how to remedy them in the home. These are questions in which every intelligent mother should be deeply interested.

In an article in the report of this Congress, entitled "The Causes of Crime in Normal Children," Mrs. Frederick Schoff of Philadelphia presents a strong argument for the education of parents. Mrs. Schoff was at that time President of the *Phila. Juvenile Court and Probation Association,* a member of the *American Committee for the Congress on Home Education* and president of the *National Congress of Mothers* and of the *Parents-Teachers Association.*

"As an earnest student of child life for many years, as one who through the rearing of a family of sons and daughters has learned much of child life, as one who for twelve years has given the closest thought and study to conditions of childhood, in home and school and nation each year has deepened the sense that the world must awaken to the fact that it is the ignorant and unscientific and injurious treatment of children that causes disease and crime."

* * * * * * * *

"The lack of wise sympathetic care and training by parents is the principal cause of juvenile delinquency.

"Good parental care is the first requisite for prevention of criminality. Parents who may be very good people have absolutely no knowledge of the science of child nurture. They are not intelligent in developing the physical or moral nature. They fail through lack of knowledge quite as often as through neglect. The misdirection of boys is much greater than that of girls. Parents do not prepare them to meet the temptations they encounter. The home is not made attractive. The desire for activity and excitement is repressed and not met by providing a safe outlet during the adolescent age."

* * * * * * * *

"The science of child nurture must be taught to parents. They are not to blame for their ignorance for there is no provision for the acquirement of such knowledge. It is more important that education for parents concerning child development and care should be

made compulsory than to make it compulsory for children to go to school. The terrible mortality of infants shows this parental education alone can save babies' lives. It is essential in prevention of crime."

This argument is for the moral side of the question and is also a negative suggestion, dealing with the prevention of an evil rather than with the production of good. As arguments on the positive side, and striking rather because of mental than moral attainments, we have the experiments in child education carried on by the father of Carl Witte, Professor Sidis of Harvard, Dr. Berle of Tufts and others. In his recent book, The School in The Home, Dr. Berle shows by convincing reasoning and illustration that early childhood is the time for acquiring mastery of correct English, which is the tool of knowledge; it is also the time for mind culture, fertilization, for the inculcation of the most profound truths, for mental self-organization, for the breeding of intellectual ambition, the implanting of moral ideals and for learning to appreciate the pleasures of the mind.

In relation to the formation of good mental habits he says: "Clearly this is a parental question. It cannot be left until the period called 'school age' as though this age came automatically according to some heavenly arranged arithmetical succession. By the time what is called school age arrives, the damage has usually been done. The habits while not utterly deranged, have been deformed by ill usage and the very mind stuff itself corrupted by the infusion of all kinds of superstition, puerility and falsehood, so that only the most persistent effort on the part of everybody concerned—parent, teacher and the whole organization of church and state and home—can scarcely bring order out of the chaos which the early sterilization of the mind has produced."

Whether these intellectual experiments are going to prove truly successful and whether all children shall be educated in a like manner does not matter so much here. If degrees and distinctions count for anything we can believe these children have a good mental equipment. We surely cannot deny that vast possibilities are here revealed. We have practically gotten our hands upon the most vital point in the development of the individual. It remains for us to prepare to use this knowledge for realizing our ideal for the individual and for society. This preparation must be definitely directed to the end, not casual or incidental.

"Nor will the necessity for effective training on the part of parents ever cease, if the home is to fulfill its function. As in other pro-

fessions of life there will always be the need of scientific preparation and subsequent growth in wisdom and inspiration." [4]

Nor does this education for the home and the bringing up of children preclude other social service. Great philanthropies have usually been the outgrowth of the same instinct which underlies intelligent sympathetic parenthood. After the children are grown it would be only natural for a woman to turn her experience to account in educational activities outside the home.

"The maternal instinct marvellously qualifies woman to offer the tiniest human being her whole love, to preserve and protect it with the sacrifice of her life. The spiritualization of this instinct means that such love shall become ever richer and freer. It means that she shall mother not only her own children but all children.

* * * * * * * * * * *

It is a woman's right to see that potential humanity shall not fail to realize all the possibilities for lack of mother's love and that woman's power shall not decay because it is not spent in blessing mankind." [5]

When woman can become her highest self through educational opportunities she may more rightfully be the adored which she has always been with cautious reservations. For living in harmony with the laws of nature, using all knowledge as a revelation to more perfect life, and having a mind ever open to new revelations she would truly become more divine.

Does not Walt Whitman have in mind such a woman?

"Unfolded out of the folds of the woman man comes unfolded and is always to come unfolded.

Unfolded only out of the superbest woman of the earth is to come the superbest man of the earth.

Unfolded only out of the friendliest woman is to come the friendliest man.

Unfolded only out of the perfect body of a woman can a man be formed of perfect body.

* * * * * * *

Unfolded out of the justice of the woman is all justice unfolded.

Unfolded out of the sympathy of the woman is all sympathy.

A man is a great thing upon the earth and through eternity, but every jot of the greatness of man is unfolded out of woman.

First the man is shaped in the woman, he can then be shaped in himself."

---

[4] Fannie Fern Andrews. *l'Union de l'ecole et de la famille.* Boston.

[5] Geo. Burman Foster, "The Woman Movement." *Progress Magazine,* Feb., 1911.

III. The Ideal School for Home-Makers

The School is situated in the country to the northeast of the town of —— from which it may be reached by a fifteen minute walk beyond the borough limits, by electrics running every half hour, or by train to the little station of Oakland. The founders were most fortunate in being given by the will of the owner the opportunity to purchase at a very low sum an estate in excellent condition belonging to this gentleman, who, beside being philanthropically inclined, was much interested in landscape gardening and the preservation of the natural beauties of his six hundred acres. Much of the original beauty of the land remains; its native woodland, stony brooks, and broad meadows. Three little lakes afford opportunity for swimming, boating and skating. Beautiful sunken gardens, where blooms a continuous succession of flowers from early spring to late autumn, water gardens with lilies and gold fish, unexpected little fairy glens, and old gray vine-covered walls proclaim the unrivalled skill of an English architect.

During the spring and summer the vegetable gardens scientifically laid out and cultivated by the students of the nearby Agricultural College and the experiment gardens of the students are objects of interest to the visitor. The large athletic field and tennis courts are placed in such a way as to be inconspicuous. Special effort has been made to prevent the school from having an institutional appearance in any respect. It might be considered rather as a country community or little village with not too widely separated cottages, the styles of architecture varying in details, but model little houses built with a view to real economy, perfect lighting, heating, sanitation and beauty. The old manor house was admirably adapted to the needs of a school building after some alterations. Here are the laboratories, shops, lecture rooms, a gymnasium, an auditorium, library and a model Kindergarten and school room for the children.

One of the most interesting features of the school is found in the pretty little cottages scattered here and there in which live, not students learning to be home-makers, but children ranging in age from one year and under to fifteen years. At the time of the founding of the school, one of the originators conceived the idea of inducing the managers of a certain (rather badly managed) asylum in a nearby city to sell out and bring the children to the country in order that they might be living a more wholesome life and at the same time be furnishing an opportunity to the students for working practically as well as theoretically with children. There is a special pamphlet describing the life and activities of the chil-

dren and the possibilities for their future usefulness. It is enough to say here that the school work of the younger children, the games and plays of all of them, and the management of their homes and home life with respect to food, clothing and personal habits and house duties are largely in charge of the students under excellent supervision.

The aim of the school is primarily to educate woman for the home, to give her not "the higher education" as Mr. C. W. Saleeby says, but "the highest education." It is also an excellent preparatory school for more specialized schools of Domestic Art and Science if a student desires to follow out some particular line of work in which she may have become interested here. It is expected that a young woman will gain a reasonably large number of useful, definite facts as a present and future working basis for her work as a home-maker, a knowledge of the best methods of work, an appreciation of the universal principles underlying all phases of life, society, and the biological, physical and psychical world, a vision of the meaning of abundant health, and deep abiding intellectual interests and loves. Incidentally the school is as a Bureau of Information to the citizens of the nearby town. To these it furnishes the latest news on the subjects most concerning home-makers, *i.e.,* nutritional questions, household furnishings and appliances and movements in regard to the education of children, etc. The books and magazines in the Library are at their service in the building; it is hoped in time that the library may be entirely free to those wishing to draw out books. Members of the faculty and senior class speak frequently at the various mothers' clubs in the town. The townspeople are cordially invited to lectures by outsiders given at the school.

Entrance Requirements

The number of students at the present time is limited to two hundred and fifty so that great care has to be exercised in receiving students. The qualifications of all desiring to come are considered, and all things else being equal, those who are natives of the town or county are first admitted except in rare cases.

Blanks will be sent to applicants to be filled out by the principal of the last school attended and by the family physician. An applicant must be at least seventeen years of age.

Although it is most important that a student shall have done work of a high grade before applying for this school, character and good health will be considered above any other qualifications. Before the final acceptance there shall be a

personal conference with the principal, a physical and mental test and a written examination of the applicant's ability to use good English.

Because a student is once admitted it does not mean that her place is assured for the whole course of four years. A student who shows herself truly interested and in earnest and in sympathy with the aims of the school will in all probability receive an invitation to return after each year's work.

It is a theory of the school that burdening the mind with a great number of unrelated, unessential facts is as injurious to one's healthful mental life as unnecessary food is detrimental to the physical life. It very often happens that a specialist in his particular line has become so interested in the finer points of his subject and lost to the relation of the subject as a whole to life that he fails to distinguish between what is of value to the pupil who cannot specialize and the points which are of especial interest to him. Before the beginning of the school year much time is spent by each instructor in planning and correlating his work with that of every other offering work to students of the same class. For this purpose a brief convention is made necessary but it is hoped by this means it will be possible to eliminate the unnecessary to such an extent that the mind of the student may be kept in good tonic condition and fresh to attack every problem as it presents itself in the laboratory or class room. First and last it is health that is desired. "A sound, accomplished, beautiful body, a sympathetic, intelligent mind, a reverent spirit; this is education."[6]

Religious Life of the School

A word should be said in regard to the religious life of the school. It is not a denominational institution, nor is there any attempt to teach any doctrine or religion save that of reverence for a Higher Power, justice, conscientiousness, happiness, kindliness and good fellowship. At the beginning of the morning session there is singing and reading selected for its inspiration to the highest moral and spiritual life. To live the highest and best life according to his knowledge is the duty of everyone and the ways and means should not be questioned. It is held to be of greater importance to live a convincing life than to preach the best of sermons. Students may attend and are encouraged to attend the churches in town where they may come in contact with normal actual life. For those who desire

[6] Organic School of Education, New Hope, Alabama.

it there are the regular so-called communion services held every Sunday morning at the school, social, friendly conferences in which all have a part and no one is the particular speaker. In the evening there are group gatherings in the cottages for singing or reading—not compulsory. Occasionally great men and women address the school, at other times there is music and singing for which the students may invite their friends.

The question "What is to be the religious education of children?" throwing aside all preconceived ideas or current practices is one to make the young people thoughtful and interested.

The Social Life

The social life of the school cannot be said to be a thing apart from the work—working together and playing together is in itself a great social opportunity. But there are times for doing things a little out of the usual routine and for giving other people pleasure. There are children's festivals, boating parties, tennis tournaments, walking and camping parties and picnics to which the girls may invite their friends away from the school—both girls and boys. There is the singing at the hospitals and Old Peoples' Homes on Christmas and May mornings, the Reading Recitals and Musical Entertainments. But though there are these many things to be done they do not occur so frequently as to interfere with the work, and the situation of the school, its natural beauties and the education of the girls makes entertaining comparatively simple. It is merely a matter of sharing the advantages of the school with others.

The Curriculum

The courses offered are as follows, alphabetically given, not in order of importance:

1, Art; 2, Biology; 3, Chemistry; 4, Clothing and Textiles; 5, (Education); 6, English; 7, Gardening; 8, Household Management; 9, History; 10, House Planning; 11, Kindergarten; 12, Literature; 13, Mathematics; 14, Music; 15, Nursing; 16, Philosophy; 17, Phys. Educ.; 18, Physics.

Art.—I. An elementary course in drawing and color work with simple nature objects, fruits, leaves, flowers, etc., for studies. Practice in producing effective landscape sketches in color by simple means. Rapid no-detail sketching with lines to illustrate stories of action for children: Designing of cards for seasons, days, special occasions. One hour a week for a year.

II. Elementary work in carpentry, basketry, brass, clay modelling, stencilling, embroidery and paper construction. The year will be divided so that a certain amount of time will be devoted to each subject and in the latter part of the year opportunity will be given for each student to devote the regular laboratory time to that branch of the work which most interests her.

III. History and Appreciation of Art.

The first half year will be devoted to a birdseye view of Plastic and Pictorial Art and its development from the time of the Greeks until the present time, the students marking for further study those pieces which, in their opinion, have an aesthetic value independent of their value historically in the evolution of Art. The lives of the greatest artists will be noted but studied in detail in connection with the biographical course under History. The latter part of the year will be occupied with a study of great pictures and statuary of the past and present, with reading and discussion of the most interesting pieces of literature inspired by them or by which they were inspired.

IV. The final course in the department of Art consists of a theoretical and practical part. The theoretical will deal with the psychology of Art in its application in line, form, proportion, color, respectively and in combination. There will be opportunity for observation and criticism of the application of these principles in the work of experts in House Decoration and Costume Design. Some time will be spent in consideration of pictures suitable for the different rooms of the house and the place and value of plastic Art in the home. The laboratory part of the course will be the practical application of these artistic principles in combination with those of hygiene and economy to house furnishing and decoration. Styles of furniture, carpets, hangings, wall papers, picture framing will be tested out and experimented with to determine their proper combinations and suitability for various rooms. China and linen will be studied from this view point, the aim of the course being to call the attention of the students to artistic, inexpensive effects which may be obtained and to emphasize the uselessness of bric-a-brac and ornaments not necessarily lacking in beauty themselves, but too often unappreciated in their surroundings and more often an unnecessary burden to the caretaker.

Biology—I. General biology, a nature study course designed to arouse a genuine love of stars, trees, flowers, plants, animals and birds. Not in any respect a laboratory course but an outdoor study of the seasons and what they bring, the

trees in spring, summer, autumn, winter, the birds and animals, their habits and relation to the environment, the insects and the good and harm they do. Thoreau and other nature writers and poets will be studied in this connection partly in this department and partly in the Literature department. Outdoor expeditions will be taken throughout the year but during the winter months, when the weather is too inclement for walks, by means of lectures and pictures there will be a brief review of the plant and animal kingdoms with some attention to distribution and evolution.

II. Anatomy and Histology: The first half year will be given to the laboratory study of the anatomy of the Cat with frequent references to human anatomy. During the second half year the histology of the different tissues and organs will be studied.

III. Physiology and Hygiene: Physiology is given in the first half year; this course deals with circulation, digestion, excretion, respiration, the normal activities of the nervous system and special sense organs and muscular action. Hygiene is given in the second half year, personal hygiene of exercise, fatigue, rest, common preventable diseases, care of the eyes, ears and feet, bathing and clothing. Problems of public and domestic sanitation, ventilation and the spread of disease will be discussed.

IV. The first two terms of the year, the anatomy of the reproductive organs and the physiology of reproduction is studied, prefaced by a brief study of the means of reproduction in plants and animals. Especial attention will be given to the influence of the general health, nutrition, exercise, rest of the mother previous to the birth of the child and during the period of lactation. During the last term theories in regard to sex determination, principles of heredity and general eugenic problems will be discussed.

V. A course in the anatomical, physiological, psychological development of the child from birth until adolescence with particular consideration of the kind of food, mental stimuli, the proper balance of rest and exercise and the interests best calculated to develop an efficient, happy, lovable personality. There will be practice in the use of the Binet Test. Especial emphasis will be placed upon the care and feeding of the child in the first three years of life and upon the necessity in later years of guarding against the deforming influences of long periods of school work and faulty attitudes during school hours. The moral and social nature will be studied. To supplement this work there is the practical work with the children and the study of child nature through literature.

Chemistry—I. An elementary course in chemistry dealing with every day practical problems such as are met with in cooking, cleaning of metals and woods, food adulteration and preservation, dyes and their effect upon dress materials, etc.

II. A course in physiological chemistry preparatory to the study of Physiology and Dietetics.

Clothing—I. A course for the discussion of the real values of clothing, aesthetic, hygienic, economic, and the durability of different materials. The significance of the frequent changes of fashion.

II. Simple sewing for teaching the stitches and the use of a sewing machine, mending, darning, patching, making of underwear.

III. Dress-making—design and execution of dresses. The girls make their athletic costumes and gymnasium dresses.

Cooking—I. To give introduction to the simple operations in cooking and acquaintance with kinds of apparatus. Plain cooking, management of fires, care of cooking utensils, relative values of different kinds of utensils, experimentation with gas, electricity, hard and soft coal, fireless cookers, to determine economy and most satisfactory results. Refrigerators and thermos vessels.

II. Dietetics. Study of the composition of foods, their physiological value and proper combination. Dietaries best adapted for individuals in various occupations and the feeding of infants and children.

III. Advanced Cookery. A continuation of course I and in addition cake baking, fancy cookery, preservation of fruit and vegetables.

IV. Course in marketing—what and how and when to buy. Discussion of production, sources of supply, preparation and means of transportation.

V. Preparation of menus and meals for the children and students.

English—There is no course in English composition. The talks and papers given by the students in the different departments will be the practical work. Emphasis will be put upon clear, logical, accurate expression, oral and written, in all courses. There are English readers or censors whose work it is to read papers and confer with the students in regard to their work.

Gardening—I. Practical gardening—flowers and vegetables —a course designed for those who may have the opportunity of having a small garden in town or city—it is not intended

for gardening on a large scale. Discussion of the best methods and times of planting seeds, flower and vegetable, of the way to have a continuous succession of bloom in the garden. Hot beds, window boxes, care of flowers indoors. Suggestions for beautifying the home, its yard or garden, the town or city streets.

History—I. Universal History. The object of this course in history is to give the students a big idea of the development of man from the earliest known condition to his present state of development, his struggle for existence, his growth in knowledge and power of mastering his environment, the evolution of the home, the development of co-operation and ethical ideals, woman's place in the family and in the state. The rise and fall of nations, reasons for eminence, cause of downfall; big movements, crusades, migrations, wars. The life of the people at different periods and the philosophy of history, the lesson of past events for present action rather than the remembering of long lines of kings or rulers and the manoeuvers of military captains.

The students have large note-books containing the outlines of history, the periods and dates, political and military events of significance—these are to be filled in with the data of especial interest to them as students of the development of the individual and of social customs and institutions or in connection with the Arts and Sciences and Literature.

II. A course in biography in which the lives of great men and women of all times are studied to discover their powers and characteristics and in what relation they stood to their time. Much practice will be given in presenting the stories of heroes and great men in an attractive form to children.

III. Present day current events, social, economic and political problems, philanthropies, missions. Instructors will address the school at the beginning of the morning session on topics of current interest. The seniors will take this responsibility, with help and advice, during the last half year.

House-planning—I. Lectures on house-planning considering purpose, convenience, beauty, hygiene, economy. Evolution of the house and reasons for different styles of architecture. Review of standard American and English styles of architecture and discussion of suitability for use in various localities.

II. Observation and criticism of cottages, bungalows and houses—drawing of plans of interiors, method of procedure and points to consider.

Household management—I. Distribution of income, economy. Planning work of the household, care of the various rooms.

Family pleasures and outings.

Kindergarten (Education)—I. Study of theory of Kindergarten, Montessori school, Berle and Sidis on early education of children.

II. History of Education.

III. Study of gifts, occupations, games and dances.

IV. Practical work in children's Kindergarten and in children's cottages.

The courses in art, nature study, drawing and painting and construction work, literature, are adapted for use in this department.

Practical Laundering—I. Methods of Laundry work—practice in washing and ironing different articles of clothing. Consideration of soap, water, washing machines, mangling, electric and gasoline irons.

Literature—I. Study of great pieces of Literature from Bible, poetry, fiction, drama.

II. Study of Literature adapted to children. Psychological basis of the suitability of certain books for particular ages or stages of development in satisfying needs of the mind at the time and creating ideals for action. Preparation of book lists. Collection of poems and songs, national, seasonal, festival, nursery rhymes and tales. Dramatization of stories and poems for children to act.

III. Reading or Elocution. Interpretative reading, memorizing of poetry, story telling, dramatics.

Mathematics—I. Practical arithmetic—method of keeping accounts. Simple geometrical principles as they are found to apply in any of the work. Business methods and customs.

Music—I. Vocal—practice in reading music.

II. Piano—lessons will be given upon request if a student is able to take the work.

III. Chorus singing.

Nursing—A course in training for care of the sick at home, emergencies, bandaging, antidotes, symptomatology, diet.

Philosophy—I. Elementary psychology—analysis of sensations—study of mental processes.

II. Ethics: Relations of individuals to one another, family relations, individual's duty to society.

III. Analysis of psychological nature of man, woman, child, as based on anthropological differences and peculiarities.

Characteristics of different races and peculiarities due to climatic conditions.

IV. Philosophy of Religion: Types of Religion of different periods and countries. The Christian Religion—its ethical nature. Religious education of children.

Physical Education—I. Formal Swedish gymnastics and corrective work.

II. Athletics: Hockey, Basket Ball, Tennis, etc., Swimming.

IV. Dancing: Folk dances and aesthetic dancing.

V. Practice in planning walking and camping expeditions.

III. A course in the theory of corrective gymnastics, observation in the children's clinic to impress upon the minds of the students the importance of the utmost care of children in the periods of growth.

A Bibliography of General References

Books.

Berle, A. A. The School in the Home. Moffat, Yard & Co., N. Y., 1912.

Gilman, C. P. Women and Economics. Small, Maynard & Co. Boston, 1898.

—— ——. The Home. Charlton Co. New York, 1903.

Key, Ellen. The Century of the Child. Putnam. New York, 1909.

Saleeby, C. W. Parenthood and Race Culture. Moffat, Yard & Co. New York, 1909.

Report of the Third International Congress on Domestic Education. Brussels, 1910.

Magazines.

Good Housekeeping, 1910-11.

Journal of Home Economics, 1909.

Outlook, 1909.

Progress Magazine, 1911.

EUGENICS

By A. E. Hamilton

Introduction: Historical

The bubbling over of Eugenics from laboratory and learned society into the public press has left many of us inquiring, with Rabbi Ben Ezra—"We all surmise, they this thing and I that: whom shall my soul believe?" Chestertonian marriage by the police, Schopenhaurian sterilization of all scoundrels, Nietzschean breeding of supermen to run the human race, and even the popular baby-show are regarded as near of kin to what Conklin calls this "infant industry."

Eugenics has been epitomized by Chamberlain (6), Field (25), and others, while Davenport (13), Kellicott (48) and Schuster (86) have presented the subject in greater detail. The volume of literature claiming to be eugenic grows daily larger and it is the purpose of this paper to review a part of it. Pre-Galtonian writings of eugenic flavor, such as the Bible with its record of the first wholesale elimination of the unfit in the story of Noah; Plato's Republic advocating a lethal chamber to take the place of Lycurgan rocks; Aristotle's prenatal speculations; the song of Theognis of Megara; Campanella's utopian city of Platonic pattern; ante-nuptial inspections as pictured by Sir Thomas Moore; Malthusian concern for the feeding of the species—all these must be passed by with a mere mention.

The present eugenics movement sprang from the great mutation in thought initiated by Darwin's "The Origin of Species" in 1859 and had its specific starting point in two articles by Francis Galton in *MacMillan's Magazine,* June and August, 1865. Their thesis, that better men could be bred by conscious selection, was continued in "Hereditary Genius" (29) published in 1869.

This was an elaborate and painstaking study of the biographies of 977 men who would rank, according to Galton's estimate, as about 1 in 4,000 of the general population in respect to achievement. The number of families found containing more than one eminent man was 300, divided as follows: Judges 85, Statesmen 39, Commanders 27, Literary 33,

Scientific 43, Poets 20, Artists 28, Divines 25. The strong constellations of interrelated eminence led to the conclusion that heredity played a very important part in achievement and suggested that by selecting from strains that bore eminence, a superior human stock could be bred.

The attention given to Galton's ideas by Sir Charles Lyell in his "Geographical Evidences of the Antiquity of Man" and the welcome they received in Darwin's "The Descent of Man" stimulated eugenic thought and encouraged its leader to continue his work. He questioned 180 eminent scientists relative to their education, inheritance and relationships, and from the data obtained built "English Men of Science: Their Nature and Nurture" (30) which re-emphasized his contention that heredity played the greater rôle in achievement. In 1883 came Galton's "Inquiries into the Human Faculty and Its Development" (31), a set of evolutionary and anthropometric essays where the word Eugenics was first used in a new exposition of the author's views. "Natural Inheritance" (32) appeared in 1889, being the cream of various memoirs published since "Hereditary Genius," dealing with the general biological principles underlying the study of heredity and continuing the study of resemblances between individuals in respect to stature, eye color, artistic faculty and morbid conditions.

Galton watched the slow spread of his idea quietly until the year 1901, when he defended "The Possible Improvement of the Human Breed under Existing Conditions of Law and Sentiment" (33) before the *Anthropological Society.* Three years later he read a paper entitled "Eugenics; its Definition, Scope and Aims" (34), to the *Sociological Society.* His program, in brief, was as follows:

1. Disseminate knowledge of hereditary laws as far as surely known and promote their further study.
2. Inquire into birth rates of various strata of society (classified according to civic usefulness) in ancient and modern nations.
3. Collect reliable data showing how large and thriving families have most frequently originated.
4. Study the influences affecting marriage.
5. Persistently set forth the national importance of Eugenics.

The year following, Galton again read before the Society (35), suggesting the award of certificates of quality to the eugenically fit. He also maintained that marriage customs which are largely controlled by public opinion could be modified for racial welfare through a moulding of public sentiment.

William McDougal next focused the attention of the Society on Eugenics when, in 1906, he made "A Practicable Eugenic Suggestion" (54) in the form of an "Endeavor to introduce the custom of remunerating the services of every person belonging to a selected class (of the racially fit) . . . according to a sliding scale such that his income would be larger in proportion to the number of his living offspring." He wished the State would take the initiative so that corporations and philanthropies would follow suit if the measure proved effective. No satisfactory answer, however, was found to Benjamin Kidd's inquiry as to what constituted the measure of breeding fitness in the intellectually superior.

Two years previous to the reading of McDougal's paper Galton had founded a Research Fellowship at the University of London to determine, if possible, what the standard of fitness was, and in 1905 a Scholarship was added. Mr. Edgar Schuster and Miss E. M. Elderton held these posts until 1907, when Professor Karl Pearson took charge of the research work and, at the resignation of Mr. Schuster, Dr. David Heron was appointed Fellow. On Galton's death, January 17, 1911, it became known that through the terms of his will a Professorship was founded and Professor Pearson invited to hold it. This corps of workers constitutes the Eugenics Laboratory staff, whose purpose is pure research. The product of the laboratory is embodied mainly in two series of publications, Memoirs and Lectures supplemented by Studies in National Deterioration published by the Department of Applied Mathematics of University College. Most of the important studies have appeared in Biometrica, first issued in 1901. The hearty co-operation of physicians all over the United Kingdom has been secured and it is hoped that the Galton laboratory may become an effective clearing house for all authenticated material on human heredity that may come to light in the fields of pathology and normality. In 1901, Professor Pearson (73) delivered a lecture on national stability as related to heredity which attracted wide attention owing to its timeliness, coming as it did when England was appalled at her losses in the South African war, to which she had sent much of her best breeding stock.

A notable discussion of the strictly hereditary aspects of Eugenics took place before the *Royal Society of Medicine* (8) in 1908, when Professors Pearson and Bateson upheld respectively the biometrician and mendelian methods of approach to the problem of inheritance. It is regrettable that the controversy between the two schools has not by this time dwindled to negligible proportions, since they represent the obverse and

reverse of the same labor to a common end. Perhaps the day will come when the biometrician, dealing with mass values in the way he is peculiarly fitted by training to do, will be ready to receive, classify, analyze and correlate the data gathered by the mendelian in his intensive study of individual phenomena. At the same time, the biologist must be called upon to give adequate proof that his data are sound and thoroughly tested before they shall be so used.

To spread such knowledge of Eugenics as might be gathered by specialists, the *Eugenics Education Society* was formed in 1908 with Francis Galton as honorary president and a council of forty to direct its policy. Its official organ is the *Eugenics Review,* in which papers read before the society and a digest of all matters of eugenic import appear. Branches of the Society have been formed in Belfast, Birmingham, Glasgow, Haslemere, Liverpool, Manchester, five in New Zealand and one in Australia. There is a large membership also in the United States. The scope of interest comprises: (a) Biology in so far as it concerns hereditary selection, (b) Anthropology as related to race and marriage, (c) Politics, where it bears on parenthood in relation to civic worth, (d) Ethics in so far as it promotes ideals that lead to the improvement of social quality, (e) Religion, in so far as it strengthens and sanctifies eugenic duty. In "Essays in Eugenics," 1909, (36) Galton again set forth his aims, endeavoring to put in a simple way the principles underlying biometrical studies. He suggested that someone continue this work as he thought that without at least a general concept of mathematical methods as applied to the study of heredity the public would not appreciate the results of much important research. Miss Elderton (17) and Mr. Schuster (86) have done this.

Constable (10) built a book refuting Galton's "Hereditary Genius" and contending that the clustering of eminence around a specific nucleus for two or three generations forward and back is but the crest of a wave on the surface of the race, a manifestation of the reserve energy possessed in even distribution by humanity as a whole and not limited to a certain strain or breed. Intellectual improvement of mankind is possible, but only through utilizing powers now at hand, ready to be used when opportunity shall be given to all alike. He seems to have overlooked the fact that Galton takes practically this same view and, in regard to Eugenics, says (37, p. 311): "What I desire is that the importance of eugenic marriages should be reckoned with at its just value, neither too high nor too low, and that Eugenics should form

one of the many considerations by which marriages are promoted or hindered, as they are by social position, adequate fortune, and similarity of creed."

Lester Ward (93) attracted much attention to Eugenics through his vigorous opposition to Galton's idea of the supremacy of nature over nurture. Hobhouse (42) sees a mutually cancellatory process in variation of good and bad and believes progress to be more dependent on the survival of the good than on the elimination of the weak. He sees in the writings of Eugenists no inductive basis for assuming race deterioration and argues that, "It is not human quality whether original or acquired that differs profoundly from period to period. It is the turn given to human quality by social structure." He points out that Spencer's law of the inverse ratio of fertility and development is no new thing, and that the race probably always will recruit itself from what are termed the lower strata of society. Not lack of parental instinct, but consideration for wife and child, he holds to be at the root of so called race suicide, and believes education will in due course keep the race from the extremes of birth limitation. Nearing (61), from the sociological side, is optimistic regarding the decline of the birth rate in civilized countries, saying that, "An equilibrium of population has been established through the saving grace of the decrease in birth rate commonly called 'race suicide.'" Bateson, as a biologist (4), tells us that "it is in a decline in the birth-rate that the most promising omen exists for the happiness of future generations." Wilcox (96), from the figures of the statistician, finds no grounds for despair although admitting the obvious danger of recruiting society in majority from the lowest level of humanity, owing to the failure of the better to keep up their numerical standard. Chapple (7) sends forth a book from New Zealand, however, which sees calamity in the swamping of the better through the greater fecundity of the orders that are the last to learn preventive measures and the last, perhaps, to practice them.

Doctor Hall's comprehensive treatment of the question of fecundity (40) and its relation to Spencer's law of the inverse ratio of fertility and individuation would suggest that the upkeep of the numerical standard in families will tend more and more to be of a rational and eugenic character, and that in proportion as culture and intellectual development carries with it a comprehension of the principles of racial welfare will the birth rate be regulated in accord with eugenic aims.

Before he died (Jan. 17, 1911), Galton's charming and

modest autobiography appeared, closing with the following words in regard to Eugenics (37, p. 323):

"Its first object is to check the birth-rate of the unfit, instead of allowing them to come into being, though doomed in large numbers to perish prematurely. The second object is the improvement of the race by furthering the productivity of the fit by early marriages and healthful rearing of their children. Natural selection rests upon excessive production and wholesale destruction; Eugenics on bringing no more individuals into the world than can be properly cared for, and those only of the best stock."

From July 24th to 30th, 1912, about 800 men and women, including some of the foremost scientists and scholars of Europe and America, registered at the *First International Congress on Eugenics* held in the Imperial Institute, University of London. The Congress was not technical; most of the 35 papers were of a practical nature, but all were on a high level of seriousness and accuracy. Through the sympathetic action of the London press the ideas and ideals of the Congress were made widely public with the result that not only has there been an increasing number of serious students of the subject, but also the American caricaturist, journalist, short-story writer, novelist and playwright have been given a new instrument for the befuddlement of people's minds.

France, whose population in 1811 was 16% that of Europe, and in 1911 about 9%, and whose birth rate has been steadily falling until her contribution to the world's increase is only about .3 per thousand, has, through child-labor laws, compulsory education and old age pensions lessened the economic value of children to their parents and now welcomes positive eugenic measures such as subsidies for large families, reduction of personal taxation in accord with family increase, etc. Institutions such as the *Allaitement Maternal, Ligue des Mères des Familles, Consultation de Nourrissons* and *Mutualité Maternelle,* whose work Dr. Smith (83) has reported as encouraging the right of motherhood, an endeavor to lessen infant death and the propagation of eugenic ideas among the people may, when multiplied, show an appreciable effect on the differential birth-rate.

Almost contemporaneously with Galton, Morel (57) saw in the regenerative influences acting on races of plants and animals a suggestion for a possible analogous improvement in the human stock by proper crossing and racial mixture. He pointed out the dysgenic effects of alcohol and drugs on the race, warned against consanguineous marriages which tended to emphasize defects in a line and hoped for the same improvement of humanity through attention to breeding, as Galton saw in his vision. Moreau (58) followed with a

work in which he grouped all brain and nervous disorders in a category with insanity and idiocy, tracing their origin to a genetic predisposition and postulating a hereditary cause back of nearly all degeneration. Later still Féré (24) brought out this theme in great detail but with the modifications and caution that a much larger accumulation of pathological data rendered necessary.

Bertillon (5), chief of the Statistical Bureau of Paris, holds up to France its "natalité pathologique" in warning of coming calamity and scores its practicers of variegated neo-malthusianism, setting against them the ideals of racial upbuilding through breeding from the best of French stock and the "practicable eugenic suggestions" that have been seriously considered in France for the stimulation of family increase. Every question of the day, he urges, should be placed secondary in the minds of his countrymen to: "Comment empêcher la France de disparaître? Comment maintenir sur terre la race français?"

An elaborate research along Galtonian statistical and anthropometric lines was made in Russia by Orchansky (71), whose only claim for the study is one of suggestiveness and whose data and results justify this claim. His facts, beautifully reduced to tabulations, graphs and curves, led him to draw inferences relative to sex ratios, sex determination, etc., which bear much less weight since such studies as those of Morgan and other experimentalists lead us to look for a solution of these problems in the nature of the germ-cells instead of in statistical correlations. Another of his many tentative conclusions was that hereditary tendencies to morbidity were greater in boys than in girls.

The *Internationalle Gesellschaft für Rassenhygiene,* a union of constituent societies in Germany, Sweden and Switzerland, is patterned after the *Eugenics Education Society* of London and carries its educational principles so far as to pledge its members to ascertain their fitness or unfitness for marriage and to remain single or at least abstain from parenthood if there is danger of their offspring falling below par. No attempt can here be made to more than refer in passing to the biological and sociological studies of eugenic color that have appeared in the official *Archiv* of this society, other than the few referred to in another section.

The *Institut Solvay,* at Brussels, Belgium, has extended a welcome to eugenic investigators and put its fine library and laboratory equipment at their disposal. In Denmark a committee is at work on proposed eugenic investigations. *"Eine ungarische eugenische Gesellschaft"* has been formed in Hun-

gary. The interest in Italy is reflected in a number of the longest studies presented at the London Congress, and Japanese scholars tell us that Eugenics for Japan will mean in large measure simply a return to some of their good old marriage-selection customs placed in a modern setting, for the principles of breeding for human soundness have been recognized by these people for many generations.

The *American Breeders' Association,* born in 1903, appointed, in 1906, a committee to investigate the claims of Eugenics to scienceship and in 1910 raised this committee to the rank of a section in the Association. At this time the *Eugenics Record Office* was opened at Cold Spring Harbor, Long Island, near the experiment station of the Carnegie Institution. With C. B. Davenport as Director and H. H. Laughlin as Secretary the Record Office has become to the United States what the Galton Laboratory is to England and has been issuing a series of Memoirs and Bulletins embodying the results of the research work done under its direction or supervision. An endeavor is being made to gather hereditary data through the use of record blanks which are distributed gratis to anyone who shows inclination to fill them out with facts concerning his ancestry and immediate relatives.

Mr. Laughlin has published a first report (52) of the work of the Record Office to which I am indebted for the following facts: Mrs. E. H. Harriman has presented a new fifteen thousand dollar office building at Cold Spring Harbor for the housing of records and equipment. Mr. John D. Rockefeller has, since October 1, 1911, provided money for the salaries of five field workers, and has met the cost of publishing the memoirs, and half the cost of the training class. The Record Office has expended, to January 1, 1913, $51,280.12, and collaborating institutions have spent approximately $7,000 in conducting research work.

Harvard, Columbia, Cornell, Brown, Wisconsin, Northwestern and Clark Universities are offering courses in whole or in part devoted to Eugenics. Some first hand investigation has been undertaken by organizations in the Y. M. C. A. as part of a year's course of study in Eugenics. Many Women's Clubs have included a serious consideration of Eugenics in their programs and professional lecturers are adding this subject to their repertoire. At the San Francisco World's fair Eugenics will be given independent recognition in the section on Social Economy.

During the Academic year of 1913 a number of lectures on Eugenics were given by professors in leading American Universities at the request of Mrs. Huntington Wilson, who has

since made it possible for the Eugenics Record Office to offer the services of an extension department, including a lecturer, to all organizations of an educational nature, including Women's Clubs, Churches and Societies. Further reference to the work done by the members of the Record Office staff will be made later.

The *American Genetic Association,* with headquarters in Washington, D. C., through the medium of The Journal of Heredity, ably edited as it is by Mr. Paul Popenoe, hopes to reach a large reading public interested in keeping in close touch with the genetics movement and Eugenics in particular.

Several thousand infants have been weighed, measured, mentally tested, scored by points and classified as to fitness at the *baby health contests* held in some 40 states during the last three years. The standardising score-cards are still crude, the method of measuring arbitrary, the mental testing largely amateurish and of little scientific value. Linking the contests with cattle-shows has hardly been a factor in their favor. Some of them have been unhygienic and hard on the babies. As an index to the rise of the curve of interest in babyhood, and as a pioneer effort to attract attention to the child-welfare aspect of Eugenics, however, they may not have been held in vain.

In 1911 about 300,000 babies died in their first year. Seven-tenths of the 42% that died in the first month did so as the result of prenatal conditions or accident at birth. Of those living less than one week, 83% died from such causes, as did 94% of those that lived less than a day. The Children's Bureau at Washington has published a pamphlet, to be had for the asking, telling how half these deaths may be prevented by prenatal care and postnatal hygiene. The author is a university graduate, a government expert and herself the mother of a family. This booklet is the first of a series of publications that promises to be distinctly eugenic in its spirit, as it should lead to a desire to know more concerning hereditary laws.

With the foregoing sketch as historical background, a few samples taken from the work that has been and is being done will show the general trend of the movement.

Analogical Studies

Galton (37), besides throwing Darwin's provisional theory of pangenesis out of court through the famous blood-transfusion experiment on rabbits, thought that Eugenics could gain much by co-operation with comparative biology. He himself bred peas on a large scale to determine regression, finding

the mean filial devitation in size to be one-third that of the parental. He also began an unsuccessful experiment in heredity with the moth *Selenia illustraria* and suggested the breeding of dogs for mental qualities as well as for physical peculiarities. Old age alone prevented him from carrying out more experiments of an analogical nature, but the science of Genetics has assumed this labor in earnest.

It is largely from the geneticist that the eugenist must take his cue. In the University of Chicago lectures on heredity in relation to Eugenics (5), in the summaries of the genetics movement by Bateson (3) and Punnett (76) and in the admirable text-book by Walter (92) the connections and the gaps between the two sciences are made plain. Although the respective lines of research may seem now to present a case of parallelism without interaction, some of the facts already brought to light are encouraging to those who look forward to a final meeting at a common point.

Since Aristotle wrote his "History of Animals" there has been contention as to inheritance of acquired characters, from mutilations to intellectuality. Even since Weismann pickled his 1592 detailed mice which, through 22 generations, failed to show caudate modification, biologists have continued to experiment and philosophers to speculate on this question.

Ribbert (80), to test the effects of blood-constituents on germ cells, injected carmine coloring matter into the veins of animals, finding most of the organs examined stained in the process but the germ cells untouched, showing their unique isolation and protection. He thinks that a long continuation of this process will show germinal modification, and believes that as certain body-cells have an affinity for certain substances and poisons, so the germ-cells have theirs, and it is the business of the eugenist to discover what they are. A rather curious speculation in this connection is his idea that a once poisoned germ plasm may in five or six generations free itself from the deleterious effects of its once toxic *milieu* if they be not repeated.

As to the influence of selection in modifying a species, the experiments of Johanssen with beans which insisted on regressing to the mean of their own pure line no matter what extreme he bred from; Tower's unsuccessful attempt to get a dark breed of potato beetles by mating the darkest of a medium colored line; Jennings' inability to modify paramecia through selection over 20 generations and Pearl's failure to raise the egg-laying capacity of hens by selective matings within the same breed would suggest that no modification can thus be brought about.

Castle transplanted the ovaries of guinea-pigs, and Davenport those of fowls, finding no foster-maternal influence on offspring obtained from them, and the main body of experimental evidence seems against the transmission of characters recently acquired through the influence of environment. Nevertheless, there have been a number of pragmatic studies showing that offspring, at least in the first generation, may be affected through influences playing on parents, and these carry special eugenic interest.

Hodge (43) conducted 28 experiments in alcoholizing dogs to test the effect on offspring. Of the normal controls 4 offspring were deformed, none born dead, 41 viable. The alcoholized dogs gave 9 dead born, 8 deformed, and only 4 out of 23 viable. Alcoholizing males and mating them with normal females affected offspring in the same way as did alcoholizing females. Nice (62) alcoholized white mice and found that 11.1% of their offspring died young while none of the offspring of normal controls failed to reached maturity. Stockard (84) caused guinea-pigs to inhale alcohol six days a week until they showed signs of intoxication. Forty-two matings gave 18 born alive and of these only seven, five of which were runts, survived more than a few weeks. Nine control matings gave 17 young, all of which survived and matured normally. The results were practically the same whether the male or the female was alcoholized. Mjoen (56) reports the work of Mairet and Combemale on dogs and that of Carlo Todde on cocks. Of 12 whelps of an alcoholized male and abstinent female, 3 died fortuitously, 2 were still born, and 7 died within two months. Acute alcoholization of cocks killed them without noticeable effect on the germ plasm. Chronic alcoholism, however, caused young cocks to lose their sexual characters and to cease crowing. The weight of their testicles was considerably reduced and the spermatic channels were deformed. Perhaps more eugenically suggestive than these experiments, however, is the work of the Mendelians.

The new *ism* that is with us because Gregor Mendel considered the peas of his garden and how they grew is built on the conception of unit characters and their determiners. Mendelism regards an individual as a mosaic of independently inheritable characters whose appearance depends on the way in which their respective determiners are thrown together in the zygote or product of the union of two germ-cells, each bearing determiners. To illustrate: Darbishire (12) bred the waltzing mouse, *Nankin Nezumi,* an animal characterized by an epileptiform lack of control over its movements, with the common mouse and obtained a first hybrid generation of

mice none of which exhibited the waltzing. Mating these among themselves gave 555 individuals, 95 of which were waltzers.

"Organisms that appear to be alike, regardless of their germinal constitution, are said to be identical phenotypically, or to belong to the same phenotype. Organisms having identical germinal determiners . . . are said to be genotypically alike, or belong to the same genotype" (92, p. 113).

In the first hybrid generation of mice the genotypic character of waltzing was hidden by the *dominance* of what Darbishire terms the "determiner for normality," that is, it was latent or *recessive*.

Darbishire also bred a common albino mouse to a waltzer of similar color save for a patch of yellow on shoulders and haunches. The result was a dark grey hybrid of normal movement and black eyes, evidently a case of regression. Mating two of these hybrids gave about one-fourth albinos, one-half dark colored mice with black eyes, and one-quarter pale mice with pink eyes. This generation consisted of waltzers and normals occurring in all three color groups, showing that there was no relation between the inheritance of color and that of movement and making a pretty demonstration of unit-character transmission.

Where single unit characters behave as dominant and recessive, as in the case of waltzing and, "normality," the ratio of dominants to recessives in the second generation has been found to closely approximate 3 to 1. Two of the three dominants will, if mated with their like, split up into the same ratio, while one of them will breed true to its kind as will the one recessive, when mated to their genotypes.

Some future Leibniz may fill all the gaps between mouse and man; but he who cannot intuit the connection between the mendelizing of a neurosis in mice and the outcropping of a similar condition in men probably lacks the determiner for imagination.

Pathological Studies

Darbishire postulated the absence of a determiner for normality of movement in the waltzing mouse. Rosanoff (81), in studying the inheritance of the neuropathic constitution in man, assumes that,—"full development and normal function of the mental faculties are dependent on the presence of a special determiner in the germ plasm. His 'neuropathic constitution' is a blanket term covering several manifestations of an abnormal nervous system, such as insanity, epilepsy and feeble-mindedness. According to neo-mendelian classification, if an individual inherit a determiner, say for normality

of nervous structure, from both parents, he is termed duplex for that character, if from but one parent, simplex, and if from neither parent, nulliplex."

From material selected to exclude psychoses and neuroses produced by disease or accident, and considering ancestral influences only as far back as grandparents, Rosanoff summarizes his finding in the following table:

CLOSENESS OF CORRESPONDENCE BETWEEN ACTUAL FINDINGS AND THEORETICAL EXPECTATION ACCORDING TO THE MENDELIAN THEORY

Types of Mating	Neuropathic Offspring Found	Neuropathic Offspring Expected	Normal Offspring Found	Normal Offspring Expected
1. RRxRR = RR				
2. DRxRR = DR + RR	190	214½	239	214½
3. DDxRR = DR	0	0	45	45
4. DRxDR = DD + 2DR + RR	107	80½	215	241½
5. DDxDR = DD + DR	0	0	77	77
6. DDxDD = DD	0	0	0	0
Totals.....	351	359	586	578

DD duplex (dominant), DR simplex (dominant), RR nulliplex (recessive).

This method of classification and analysis has been adopted by other field workers, notably Miss Collins (27) and Miss Danielson (11), whose findings, although suggestive of the mendelizing of neuropathic traits, have not fallen in so closely as Rosanoff's with expectation. The obvious danger of fitting facts to theory is doubtless avoided as much as possible, but the criticism against this method of investigation, that standards of measurement are not yet generally acceptable in regard to many traits classified, will hold good until such standards are established.

Goddard's (38) Kallikak Family strongly points to mendelizing in feeble-mindedness, forty-one nulliplex matings giving 222 children but two of which were considered definitely feeble-minded. Eight cases of normal mother and feeble-minded father gave ten normal and ten defective offspring, an exact correspondence with expectation. When one parent was feeble-minded and the other undetermined, nearly all the children were affected, from which it is inferred that the other parent was also defective. Here we have a case of dangerous inference, but here also the distinction should be made between a study largely sociological and suggestive in nature and those that claim scientific value in the field of heredity. The Kallikak family, on the basis of which eugenic field work and the mendelian hypothesis have been criticised,

is not a scientific memoir, but an interesting and suggestive description of a piece of pioneer work.

From a study of 181 fraternities, comprising 206 epileptic individuals, Davenport and Weeks (94) concluded, using the mendelian classification, that epilepsy is due to the lack of a determiner for normal development. Weeks (95) carried this study further, and from 388 different fraternities studied, he concludes that "epilepsy cannot be considered a mendelian factor by itself, but that epilepsy and feeble-mindedness are mendelian factors of the recessive type" and "each is due to the absence of a protoplasmic factor that determines complete nervous development."

F. W. Mott (60) analyzed 3,118 cases of related insanity made up from 1,450 families. He found in 18 families where insanity had been manifest on both sides 116 children, 16 of whom died young, 39 were suicidal or otherwise nervously disordered, and 61 apparently normal, making 36% of this set tainted. Ninety families with insanity on one side only showed only 9.6% adult offspring affected, 40 having died young, 33 showing nervous affection and 311 appearing normal.

The need for refinement of analysis of material studied is obvious from the foregoing. Even in such a simple case as the inheritance of catract, Laughlin (51) has shown that not only is this affection a dominant defect, but that each type of cataract (lamellar, coraliform, anterior and posterior) behaves as a single unit. Thus the generic name cataract may stand for a compound unit much as the neuropathic constitution represents a number of potential neurotic manifestations, the inheritance of each of which must be studied separately as well as in relation to its fellows. It is also plain that we have no true and definite standard for "normality" as yet, and no one would sooner admit that this is a purely relative term than the serious student of human heredity.

From the data already gathered in the field of morbid heredity, Davenport (13) has tentatively summarized those affections which appear to behave as mendelian dominants. These are: faulty enamel, toothlessness, pre-senile cataract, night-blindness, poly- and brachy-dactyly, piebaldness and possibly diabetes insipidus. In the normal field, brown eyes, caused by the presence of a determiner for brown pigment on the anterior surface of the iris, also act dominantly, rendering blue eyes, which lack the pigmentation, recessive. The affections behaving recessively are: Thomsen's disease, weakness of the mucous membranes, hemophilia, color-blindness, retinitis pigmentosa, and deaf mutism.

Adami (1) goes into much greater detail, classifying as "homeomorphous inheritance" the appearance in offspring of the same influence and symptomatology as characterized the parent, and as "heteromorphous inheritance" all that appears interchangeable, such as migraine, epilepsy, neurasthenia, hysteria and the neurotic manifestations in general. His list of homeomorphous morbidities is too long to include here.

Von Lundborg (90) would add dementia precox to the list of Mendelian recessives. Working among the people of Listerland, in the south of Sweden, and reckoning only children over 15 years of age he found:

No. of Families	Nature of Mating	Children Normal	Children Affected
11	(DD x RR)	44	..
5	(DR x RR)	20	20
11	(DR x DR)	53	24

It is hardly necessary to mention that the only value of this item from his ponderous study is its suggestiveness, as the data are insufficient for a final conclusion.

Susceptibility to diseases caused by pathogenic bacteria may or may not be inherited. The controversy regarding the inheritance of tuberculosis or the diathesis theretoward has been long and heated.

For several years the statistical artillery of the Galton laboratory has been trained on the problem of tuberculosis. The following correlations between *husband and wife* with regard to phthisis, based on the study of 1,000 marriages, were found:

All poor (Goring)	—.01
Prosperous poor (Goring)	.16
Middle class (Pearson)	.24
Professional (Williams)	.28

These correlations, taken with that of .17 obtained by Pope in a study of 41, 786 couples who were parents of at least one tuberculous child, lead Pearson to place the average coefficient of correlation at .30. Pearson worked out the correlation between *parent and child* for Phthisis and found it to be .55, while Goring with unlike material places it at .52 (86).

Because Nageli found tuberculosis in 97% of his 500 autopsies and the studies of various German specialists seem to prove that 50% of adults who die from other causes have suffered from latent or healed tubercular lesions, Pearson (72) concludes that certain individuals are relatively immune and others hereditarily predisposed to this disease. Leaving

no room for a possible discovery of variation on the part of the microbe as well as of the individual, and without evidence satisfactory to sociologists such as Ward (93) or Hobhouse (42) that there would be a net gain to humanity in cutting off the entire tuberculous stock, Pearson would uphold selective marriages as a solution of the problem.

Saleeby (82) calls alcohol a "racial poison" both on the score of its congerminal effect as upheld by Forel (28) and of the congenital influence on the fetus and mammary secretions which is now generally accepted. Mjoen (56), who devoted years of study to a few single cases of alcoholism, cannot accept Forel's theory of blastophtoria "in any other sense than that alcohol prevents the restitution or regeneration of already tainted germ plasm." He concludes that alcohol can only affect sound stock when taken during conception, maternity or lactation. Adami's (1) teratological material would probably all come under Mjoen's rubrics, and in fact Forel (28) and Archdall Reid (77) also take the view that the racial effects of the poison might be much worse were it not that it so thoroughly affects ovary and testicle of those especially susceptible to its inroads as to prevent the development of much unfitness.

A second racial poison is lead, which, according to Oliver (70), who has given it a most extensive study, diminishes the number of red corpuscles in the blood of lead workers, works havoc with the reproductive powers of both men and women and is a notable cause of abortion. Details of the several hundred pregnancies investigated and recorded by Oliver (70) and Adami (1) cannot be given here, but, speaking generally it would seem that ". . . the malign influence of lead is reflected upon the fetus and on the continuation of pregnancy 94 times out of 100 when both parents have been working in lead, 92 times when the mother alone is affected, and 63 times when it is the father alone who has worked in lead." (70, p. 200.)

To the foregoing genotoxins must be added those of syphilis and gonorea, diseases whose occultation from general public consideration has until recently been nearly complete. Since the great European epidemic supposed to have started in Galicia, Spain, in 1494 and which spread over France, Germany and Switzerland in 1495, Holland and Greece 1496, England and Scotland 1497, and Russia and Hungary 1499 there have been recurrent rises and falls in the wave of effort to exterminate the plague. In 1496 the French parliament required all persons affected to leave the city within twenty-four hours. The problem was not solved so easily, however,

and legislation regulating prostitution has been the principal method of dealing with the disease until recent years, when attention has been directed to the medical and educational aspects.

In 1864 England passed the Contagious Diseases Act, attempting to regulate prostitution, but repealed it in 1886 owing to the popular demand for "personal liberty." Not until 1899, when an International Congress was held at Brussels, did the subject come up again for serious attention. In 1905 an attempt was made to have the government take the matter in hand, but owing to the resignation of Mr. Balfour nothing was done at the time. In 1912 the *Royal Society of Medicine* and the *Eugenics Education Society* appointed a committee to report, and this will be ready soon. In August, 1913, the *Medical Congress* resolved to give the subject earnest attention.

Pioneer work in bringing the attention of the American public to a realization of the hereditary scourge of venereal disease was done by Morrow (59) and a first crop of reports concerning prostitution and its culture media, is now available. Of these the reports of the Chicago Commission, the Committee of Fifteen of New York, Kneeland's recent survey of conditions in New York City, and Doctor Flexner's summary of prostitution in Europe are the most notable.

Sociological Studies

Perhaps the light of Galton's idea of breeding better men is dimmed beneath the bushel of the accepted definition of Eugenics as "the study of agencies under social control that may improve or impair the welfare of future generations," but before it can be set upon the hill-top it must square with social ethics. We cannot cast the bantling on Lycurgan rocks nor consign our weaklings to the Platonic lethal chamber. The problem, then, is to determine who are the fit, and how best to eliminate the defective, by other than these simple means used centuries ago.

The ancients regarded idiots, imbeciles, the feeble-minded and neurotic as god-cursed and fit only for reproach and persecution. The Spartans made short work of them. Early Christians were compassionate and merciful. Confucius, Zoroaster and Mohammed advocated charity toward them. In mediaeval times they became court fools or wandering "enfants du bon Dieu." With Luther and Calvin came persecution again, and they were treated much as they are in some American schools to-day, and worse. Then appeared Pestalozzi, practicing what Rousseau preached, followed by Froebel,

and child study began. Dr. Itard experimented with the "Sauvage d'Aveyron" along Froebelian lines and led Seguin to see a great light in the change wrought in the wild boy. In 1837 Seguin founded a school for idiots in Paris and later brought his gospel to America.

In 1842 Guggenbuhl studied the cretins in Olienthal valley, Switzerland, continuing his work at an asylum near Berne until, through his influence, a colony for cretins was founded at Interlaken with cottages and hospital. Fresh air, sunlight, variety of stimuli and good food improved many patients notably. In 1850 Guggenbuhl was impeached for charlatanism and the institution abolished. He died in 1865, protesting innocence.

Saegert started a class for imbeciles in Berlin in 1845 and by 1881, 32 such classes were formed. Since then the idea of training schools for backward and defective children has spread widely through Germany.

The writings of William Twining on Guggenbuhl's work led the Misses White to found a private school for defectives at Bath, England, in 1843. In 1848, Park House, High Gate, was made the home of 27 children and two years later these, with 23 more, were removed to Essex Hall, near Colchester. Since that time the interest in and attention given to this problem has increased to national dimensions.

The Mental Deficiency Bill (55), "an act to make further and better provision for the care of the feeble-minded and other mentally defective persons and to amend the lunacy acts," was passed by the House of Commons on July 30th, 1913, was slightly amended by the Lords August 12th, 1913, and will come into operation on April 1st, 1914. This Act does not extend to Scotland or Ireland.

A person who is a defective may be dealt with under this Act by being sent to or placed in an institution for defectives or placed under guardianship—

(a) At the instance of his parent or guardian, if he is an idiot or imbecile, or at the instance of his parent if he is under the age of twenty-one; or

(b) If in addition to being a defective he is a person—1, who is found neglected, abandoned, or without visible means of support, or cruelly treated; or 2, who is found guilty of any criminal offense, or who is ordered or found liable to be ordered to be sent to a certified industrial school; 3, who is undergoing imprisonment (except imprisonment under civil process), or penal servitude, or is undergoing detention in a place of detention by order of a court, or in a reformatory or industrial school, or in an inebriate reformatory, or who is

detained in an institution for lunatics or a criminal lunatic asylum; or 4, who is a habitual drunkard within the meaning of the Inebriates Acts, 1879-1900; or 5, in whose case such notice has been given by the local education authority; or 6, who is in receipt of poor relief at the time of giving birth to an illegitimate child or when pregnant of such child.

This bill, the whole of which covers some forty legal pages with further details has been attacked severely by writers in the English press, on both medical and sociological grounds. Only a passing reference can be made to it here as an indication of the fact that the problem of the feeble-minded has at last become a national one.

Through Horace Mann and George Summer, Seguin's work was made known in America and in 1854 the first idiot-asylum and training school was established at Albany, N. Y. The following year Massachusetts opened a school of like nature, followed by Pennsylvania in 1852. Since then the number of state institutions has grown to 35, there are 19 private training schools, and in 1911, 99 cities had public school classes for mentally defective pupils, and 220 had classes for the mentally backward.

Colonies for epileptics have been established in Connecticut, Indiana, Kansas, Massachusetts, New York, New Jersey, Ohio, Texas and Virginia. Iowa has made an appropriation for a colony, Illinois has appropriated $500,000 for a site and plant ultimately to cost $1,000,000, and Michigan has begun work on an institution to include a farm of 1,000 acres.

Aiming to establish norms of mental development up from the lowest types of amentia to complete normality, the research laboratory of the Training School at Vineland, N. J., has tested several thousand children by the Binet-Simon scale, slightly modified to fit American conditions. No sweeping generalizations have been made, but the data thus far collected suggest that feeble-minded infants are heavier at birth than normals, lower grades of defectives arrive at puberty earlier than the higher grades, form mastery develops early and is correlated with the curve of intelligence, number concept rarely develops in the feeble-minded and mathematical ability never, and the Mongolian type of imbecility may be due to intra-uterine arrest of development perhaps at about the second month. Biochemical and neurological examination is made of all cases and biochemical analysis made in all cases where autopsy is permitted. Cumulative evidence of the rôle played by heredity in all classes of mental defect is also notable in the results of the laboratory's investigations. A report on the heredity of feeble-mindedness and its relation

to social problems is now in preparation. This will be a study of 327 cases from the Vineland Institution, including 327 charts, over 200 portraits of children, a brief description and history of each child, a statistical study of the data from several standpoints including the various supposed causes of feeble-mindedness, such as alcohol, syphilis, tuberculosis, injuries at birth, fevers and heredity. The relation of all this to the social problems of alcoholism, pauperism, crime, prostitution, etc., will be treated. Doctor Goddard (38), Director of the laboratory, has already preluded this work in the remarkable report of the Kallikak Family, from one member of which sprang 496 known descendants all but two of whom were respectable and useful citizens and also, through a clandestine mating with a feeble-minded girl, 480 mediocre and sub-normal individuals, 143 of whom were distinctly feeble-minded. Miss Kite, Field Worker for the laboratory, in her tracing of the Kallikak pedigree has unearthed a wealth of sadly interesting information relative to the condition of humanity in the New Jersey "Pineys" and opened the way for further investigations of the classic "Jukes" type.

In 1887 Dugdale (16) published his report on "The Jukes," a tribe of degenerates infesting a section of the State of New York, numbering some 1,200 individuals of whom 280 were professional paupers, 140 criminals, 60 habitual thieves and 50 prostitutes. A total of 2,300 years in the poor-house, seven murders, various depredations and incendiarisms and an incalculable amount of venereal disease rested on their heads. Their cost to the state when Dugdale reported was estimated at $1,308,000. What it has been since, through the inactivity of municipal and State authorities is beyond computation.

Since Dugdale reported, a number of special studies of like nature have been made and more are in the making.

"The Tribe of Ishmael" (53) was a family stock traced back by McCulloch to 1790, comprising 30 family units and 62 individuals whose descendants in the sixth generation numbered 1,750 known and 5,000 estimated with a history closely resembling that of the Jukes.

Estabrook (17a) studied "The Nam Family" in the backwoods of New York State, finding 784 individuals of whom 19 were epileptic, 24 insane, 15 in orphan asylums, 3 in girls' home and 40 in State Prison. Of the females 88% were alcoholic and of the males 90%. Licentiousness characterized 232 women and 199 men. The cost to the State is estimated (including the "drink bill") at about $1,500,000.

"The Hill Folk," two families of a New England rural community were investigated by Florence Danielson (11) who

found, among 737 persons dealt with, 136 feeble-minded, 10 epileptic, 24 showing criminal tendencies and 8 prostitutes. Alcoholism in greater or lesser degree characterized nearly all, 65 received state aid and 37 were state wards.

The Hucks, a degenerate family of farmhands, woodchoppers, etc., made up mainly of the moron class of defectives, are being analyzed by a field worker for one of the large hospitals of Massachusetts. Her results are not yet ready for publication, but thus far 315 Hucks, including 121 others who married into the family, have been included in the study. There have been 112 matings producing 12 epileptics, 50 alcoholics, 52 sexually immoral, 56 probably sexually diseased, 48 feeble-minded, all morons. Since 1860 the town they inhabit has appropriated $13,555 for their care.

"The Village of a Thousand Souls" is a middle-western town observed by Gesell for the past 33 years. Out of 220 families, feeble-mindedness was found in 37, alcoholism in 36, insanity in 22, epilepsy in 3 and a number of eccentrics scattered throughout the village.

Eugenic marriage laws, so called, have been passed in 23 States and 3 territories, the conditions under which marriage is denied being as follows (14): insane 24, idiot or imbecile 23, epileptic 9, feeble-minded 8, pauper 4, drunkard 3, physically incapable 3, venereally diseased 3, and habitual criminal 1.

It has fortunately not been necessary to multiply such investigations before the realization that something must be done struck home to those in power to do it. Whatever may be said as to the value of the marital legislation already in force, the trend seems to be in the right direction.

With minor variations in different states, marriage within and not including the fourth degree of consanguinity computed according to civil law is forbidden in the United States. The study made by Miss Elderton (18) in England, and that of Arner (2) in the United States, however, seem to show that cousin marriages are not injurious *per se,* but merely enhance the probability of parental defects characterizing offspring. This has led Davenport (14) to suggest forbidding first cousin marriages when in the parental fraternity common to both, grave defects known to be hereditary have appeared. Along with marriage regulation marches the sterilization of extreme cases of defect. California, Connecticut, Indiana, Iowa, Kansas, Michigan, Nevada, New Jersey, New York and North Dakota have passed laws permitting the operations of fallectomy and vasectomy in accord with state regulations. In

Oregon the law has passed but was withdrawn by referendum in November (1913).

Owing to the backfire of public opinion, these laws are now practically inoperative. The New Jersey law was declared unconstitutional when tested in the courts, but further appeal will probably be made.

As early as 1903 Doctor Rentoul (78) agitated for sterilization of criminals and defectives in England, but the idea has not gripped in that country. Europe first generally discussed the subject, according to Ellis (21), in 1909, when two women and two men, inmates of a Swiss asylum at Wil (Berne) were sterilized by castration and ovariotomy and allowed to go free. Since then much has been written on the psycho-physical effects of different methods of sterilizing and on the social aspects of the problem, the consensus of expert opinion being presented to the Eugenics Congress in 1912 by Van Wagenen (89). The principal conclusion is that segregation should be urged and sterilization resorted to only in extreme cases and then only with the consent of the patient or those responsible for him.

The cosmopolitanism of the United States renders its national eugenic problem extremely complex. Not only must legislation be aimed at keeping up the level of the actual stock, but an eye must be kept on the stream of foreign germplasm that constantly flows in from all sides.

From 1892 to 1912 the number of aliens debarred from entrance to the United States was 169,132, the causes being: pauperism or likelihood of becoming a public charge 58.2%, contagious diseases 15.8%, contract labor 12.7%. The remaining 13.3% were defectives, such as professional beggars, anarchists, the feeble-minded, prostitutes, etc. The proportion of those refused entrance at port of entry to those detained by examination at port of departure, Fairchild (23) estimates at about 4 to 1. He regards American inspection methods thorough as regards the feeble-minded, but the committee of the American Breeders' Association, (79) appointed to investigate this matter reported that (a) immigration laws are inadequate to exclude the unfit, (b) inspection is not thorough, and (c) inspectors are too few in number and apparently not trained in the best methods for the detection of mental deficiency. The inspector's side of the matter has been presented by Glueck, Knox and others (63-69).

Mr. Lathrop Brown of New York (3b) brought the hereditary aspects of immigration before Congress and it may be hoped that his voice is that of one crying in the wilderness to make ready the coming of a eugenic attitude on the part of

national legislatures toward problems that bear so largely on the welfare of American stock.

Thus far the sociological aspects of the problem seem sorry and dysgenic, but at least the solution is relatively simple. Segregate, prohibit marriage, sterilize—all three measures are within the limits of agencies under social control. When, however, it comes to selecting a breeding class from the fittest of mankind the Eugenist tackles the trinity of biology, psychology and sociology rolled into one problem of formidable bulk. It is in the latter two elements that he finds the greatest difficulty.

Flick (26), as mouthpiece of the Roman Catholic Church, gives his view of Eugenics thus:

> "The definition of Eugenics as given by the Eugenics Education Society . . . the program of the Eugenics Congress and many of the ideas that were expressed at that congress; most of the books which have been recently written on the subject . . . makes a discordant hodge-podge of bad philosophy, overgrown humanity born of extremely diluted, ill-nourished, anaemic Christianity and an unconscious erotism which does not bode well for civilization."

From the anti-religious and ultra socialistic standpoint, eugenic measures are even worse painted. Swift (85), writing of the millionaire, declares that,—"We child breed and place ourselves in the jaws of these gentle gorgons who crunch their riches out of all honest workers. . . . Those decent enough to abhor having their children mature as servile grooms of the rich abstain from having families; these abstainers are thoughtful, spirited and better, whose offspring would make for a higher population, and the meaner, stupider, cravener become the general begetters and the race rots." Under present conditions of capitalistic rule he thinks the family becomes the "microbe of society" and the limitation of population is but the "strike of calving slaves" who refuse to "contribute their nest of children to the wheels of toil." Next in order of evil to the millionaire is the church, his minion, which has kept the people "brutishly ignorant that they might beastfully breed" and the "fortunate collapse of religion has removed the check of ignorance concerning the means" and the "boycott on the procreation of tenders and feeders of the swilling rich" is upon us. The only justification of breeding to-day is for the purpose of destroying the system of fixed incomes which has placed us in bondage. "The new race must be absolute revolutionists" if there is to be racial salvation. "The French alliances, casting about batlike for the smallest possible bribes to spur the people to propagate" have for their object the continuation of the present function of marriage which is to "multiply the young for the hoppers of the rich"

and Eugenics is a sop thrown out to attract attention from the vital problems of the hour.

Flick (26) when he wrote of the irreligiousness of Eugenics and claimed for the church the control of family relations and the creation of new souls had evidently overlooked or ignored much of the more general literature on Eugenics in which is to be found great earnestness in advocating, and more or less clearness in presenting, the subject in the sense that Galton himself regarded it, a part of the religion as well as of the science of years to come.

Saleeby (82) whose contemplation of Galton's New Jerusalem is not distracted by too close attention to any one of its many mansions tells us of Eugenics:

> "It honors men and women by declaring that human parenthood is crowned with responsibility to the unborn, and to all time coming . . . and it makes a sober and dignified claim to be regarded as a constituent of the religion of the future. . . . Eugenics must become a living part of our religion—a religion of the most lofty and austere because the most altruistic, a religion which sets before it a sublime ideal, the intrinsic ennoblement of mankind. . . . We must create a Eugenic aspect for the moral sense. . . . If we have transferred our hopes from heaven to earth and from ourselves to our children they are no less religious 'and they that shall be of us shall build up the old waste places; for we shall raise up the foundations of many generations.'"

Dawson (15) portrays Jesus as the biological culmination of a long line of religio-moralists who should be, on the ethical side, our eugenic ideal. His doctrine of woman and motherhood strikes a chord that, as Grassl (39) has shown, needs heeding in this feministic day, for, "What shall it profit a woman if she gain the whole world of academic and social distinction and lose her own soul of motherhood?"

Chamberlain (6) thinks that all may be well if Eugenics "can always retain a sense of the divinity of the greatest human passion, and sustain the test of Shakespeare's immortal dictum." Decrying military eugenics, breeding better food for powder, and all semblances of the human stud farm, he believes—"The preservation of the family (eugamy) must form a part of what has been called the 'chivalry' of Eugenics . . . and . . . the ultimate eubiosis must be thoroughly human."

Mr. and Mrs. Whetham (98) have not forgotten to include the religious aspects of Eugenics for, "without religion and without morals there is apparently no possibility of existence for the human race, and . . . a sense of right and wrong and a recognition of some outside influence moulding human nature has become part of the unconscious heritage of mankind."

Havelock Ellis (20), while he does not consider that Eugenics comes within the sphere of religion, is confident of the final triumph of the eugenic ideal which is, . . . "but the reasoned manifestation of a natural instinct, which has often been far more severely strained by the arbitrary prohibitions of the past than it is ever likely to be by any eugenic ideals of the future. . . . The new Saint Valentine will be a saint of science rather than of folk-lore." In another book (19) Ellis has rendered us a real service by presenting the main outline of the eugenics movement from the standpoint of one who has devoted his life to some of the deepest and most important aspects of racial welfare and racial misery.

Ellen Key (50), in her splendid appeal to Scandinavian women to awaken to the call of a new freedom, coins the word Erotoplastics, to be for her what Eugenics was to Galton. Her emphasis rests largely on the psychological side of eugenic problems and invokes the law of love in its best refinement to settle many perplexities that mankind has made for itself. Again (49) she glances at the work of others in the eugenic field long enough to show us her comprehensive sympathy thereof and then goes on to re-emphasize the Spencerian method of treating childhood and to set forth a wide program of education to fit coming generations for better parenthood than has ever been in the world before. Libraries that prudishly taboo these works because their doctrine does not in every way accord with our own American view of love and marriage do the public a great wrong. They belong in the front rank of positive eugenic literature.

David Starr Jordan, in a series of little white-bound books, has been preaching a eugenic gospel with mighty emphasis on the dysgenic horror of war, graphically elaborating Benjamin Franklin's dictum that the price of war is not paid in wartime but "the bills come later." In one (44) he proposes that "the blood of a nation determines its history" and likewise that "the history of a nation determines its blood." He shows us Napoleon's trail of blood over Europe and even to the foot of the pyramids, the mounds of skulls ploughed up and piled high by European peasants who are "chained to the wheels of toil" and are marked with slanting brow and heavy jaw because they are of an inferior stock, left to live and multiply on the fields fertilized with the blood of a better type. In another (45) he continues the thesis that war is bad and that the human harvest reaped by death in wartime is a harvest of the best the nations breed. He exaggerates the rôle of war in the making and breaking of nations, and does so pur-

posely by harping largely on one string. "I would show the 'ugly, old, and wrinkled truth stripped clean of all the vesture that beguiles,'" he says, and has no use for those that claim an intrinsic good for war. In a more individualistic study (46) he sets forth the principles of heredity simply and lucidly, showing the bearing of biological studies on race improvement and making a mind-touching plea for all that Galton looked forward to in the broadest sense of the term Eugenics. Again, in "War and Waste" (47) he leads us over the battlefields of the world, shows us the huge war debts in figures followed by "endless caravans of ciphers" which indicate that not only have we impoverished the future biologically by the destruction of hosts of "the best that we breed" but that economically also we have, as the editor of *Life* puts it, "Long since passed the simple kindergarten stage of living beyond our means; we are now engaged in living beyond the means of generations to come." Dives, of Kipling's parable poem, Jordan thinks is none other than Baron Rotchschild and to him and the unseen empire of money-power is mortgaged the earth in payment for its armed peace, so that our young men who wish to marry and cannot because of their economic condition have farther to look than the mere cost of butter and eggs. It is a somber and dispiriting picture that is painted, and yet one cannot help feeling the truth of it and finding as potent a eugenic sermon in a battle-ship as he does in a family of Jukes. "What will be the end, no one can say. There is a steady growth of 'unrest' among the taxpayers of the world. There would be a still more violent 'unrest' if posterity could be heard from. And in its time posterity can save itself from utter ruin only by new inventions and new exploitations or by a frugality of administration of which no nation gives an example to-day."

President Hall (41) has shown us the one-ness of Eugenics and all that is best in the best religions of the world, and his words in regard to the Christian aspect are too comprehensive to be treated otherwise than by quoting as they stand:

"The slogan of eugenics, a new religion, the religion of this world, not of another, has caught the imagination and won the applause of many who are critical if not hostile to Christianity. But why call it a new religion? Is not all of it simply a legitimate new interpretation of our Christianity? Is it not all latent in our Scriptures? Was anything more characteristic of the ancient Hebrews of Old Testament days than their purity and to keep the purity of their blood, than duties of parents to children and vice versa, and is there any trait more peculiar to the Jews in our day than that they excel all races save perhaps one in fecundity? The very covenant of Javeh with Abraham was that if he kept God's law his seed should be as the stars of heaven for multitude, as if that were indeed the chief

human felicity. This means according to the newest and highest psycho-genetic criticism simply that Jehovah's laws are at bottom those of eugenics. The supreme criterion of virtue indeed is living in every item for the interests of posterity. The world is for the chosen, the best. It belongs to those who come after us, who will be in number like the grains of sand upon the shore. That their seed fail not is the supreme blessing. The entire Old Testament from the myth of Eden to the latest prophets needs a new eugenic exegesis, while the dominant theme of the New Testament is love, the strongest thing in the soul of man, centered upon service and welfare of the race. Love and serve God and man; that is the quintessence of our religion. We only need to turn a little larger portion of the love and service we have directed toward God, who does not need it, to man who does, and we have eugenics, for who serves mankind so much as he who transmits the sacred torch of heredity, which is the most precious of all wreaths and worths, undimmed to later generations by bringing more and better men and women into the world and rearing them to the fullest possible maturity? Read in this field and you will see only what has so long lain concealed in Christianity standing forth here revealed. The beatitudes are full of it. The meek inherit the earth on the simple biological law that overindividuation is at the expense of genesis and beyond a certain point inversely as it. . . . Christianity has never said all it meant. It is not yet all revealed to man."

Positive Studies

Galton's optimism concerning the discovery of a standard of civic worth by which to measure fitness for parenthood has led some of his lesser disciples to make indiscriminate use of the term "racially fit." There is, however, an increasing number of investigators whose work has been stimulated by the pragmatic coloring of this ideal. The following samples of this pioneer work will doubtless seem to the scientific posterity of its authors much as Aristotle's "History of Animals" does to the neo-Darwinian. They are taken as typical of what might be termed the Galtonian school of investigators.

Winship (97) records 1,394 of the 1,900 descendants of Jonathan Edwards, finding among them 13 college presidents, 65 professors, 60 physicians, 100 clergymen, 75 army and navy officers, 60 prominent authors, 100 lawyers, 30 judges, 80 public officials, 3 senators, and many influential and manufacturing men.

Woods (99) collected data relative to 832 members of European royalty, graded 671 of them from 1 to 10, from feeble-mindedness to genius and found constellations of both so notable, and correlations of resemblance in character between father and son so marked, that he was led to conclude that heredity played a very important part in making up the intelligence and morality of his subjects. In intellect he found the father-son correlation to be .30 and the same in morals.

His classification and rating is arbitrary, and most of the arguments brought against Galton's "Hereditary Genius," and even more have been directed against this study, but the fact that it was made is all that concerns us here.

In "The Influence of Monarchs," Woods (100) considers the several arguments against his methods and continues to make use of much the same system of classification and analysis not only in the treatment of some 368 rulers, but of the plus or minus characteristics of the social order in the periods which fell under their influence. The work is essentially an application of biometric methods to history and to Dr. Woods it adumbrates a science of historiometry upon which the eugenist may sometime profitably draw. The correlations between the personalities of the rulers and the alterations in the material conditions of the fourteen European countries studied suggest—"That the monarchs have, to a very large extent, caused the changing conditions and not the reverse—that the monarchs have been the product of the environment in which they lived."

Woods also culled from Jameson's "Dictionary of U. S. History" and Lippincott's "Biographical Dictionary of the World" the fact that there were relationships in the cases of 13 Lees, 11 Adams', 10 Lowell's, 9 Dwights, 8 Trumbulls, 7 Livingstons, 7 Bayards, 6 Irvings, 6 Sewalls, 6 Prescotts, 5 Channings, 5 Edwards, 5 Mathers, 5 Randolphs and 5 Winthrops besides 100 other families in which from 2 to 4 noted Americans could be found related. Further, he looked into the family histories of 46 pre-eminent Americans in the Hall of Fame and found that 26 out of that number showed eminent relationships. the total being 57, a figure greatly in excess of what random expectation calls for.

The fact that a cataract of eminence seems to tumble from a single parental source, as in the case of the Jonathan Edwards group, does not satisfy the biometrician, who rightly wishes to make an exhaustive analysis of all the important elements which make up character. Shuster (86) reports an investigation in correlation between the sensitiveness of skin in adults and their parents by means of the aesthesiometer. Thus far in the study the coefficient seems to be about .29. In reaction time it has been found to be .33 for visual and .27 for auditory stimuli. These methods, like those of Thorndike (88) who found resemblances between twins by the methods of experimental psychology to be never lower than .69 and sometimes as high as .90, indicate the trend toward applying accurate measurements wherever possible instead of depending on the schedule or the questionnaire.

Following Galton's (29) suggestion as to the value of studying correlations of ability in school and university work, Schuster (86) and Miss Elderton grouped 4,000 Oxford graduates who took or failed to take their degrees between the years 1800 and 1892, and whose fathers had also been up for the degree, so that 2,459 fell into a section going back as far as 1862. This later group was made up of 149 first honor men, 329 second, 377 third, 190 fourth, 868 pass degree men and 546 that failed. Subdividing these six classes according to the nature of the degree taken by the father, the percentages where the father had taken either a first or second class degree were, respectively to the six classes: 36.2, 32.2, 29.4, 13.8, and 12.8. The coefficient of correlation for ability between father and son in this series was found to be .3 or almost a third.

A more ambitious study was made by Pearson (74) and a corps of assistants who, during a period of five years, collected data on the physical and mental characteristics of schoolchildren and subjected it to mathematical analysis. For health, eye color, hair color, hair curliness, cephalic index, head height, head breadth and head length, the mean coefficients of correlation were, for brothers and brothers .54, sisters and sisters .53 and for brothers and sisters .51. For vivacity, assertativeness, introspection, popularity, conscientiousness, temper, ability and handwriting, the correlations were for brother and brother .52, sister and sister .51, brother and sister .52. Discrepancies, unavoidable errors, and the fact that the personal equation of the teachers who furnished the data influenced results, all taken into account, Pearson is led to conclude that mental and physical characters are inherited in the same manner and in about the same intensity. Biometrica, the official organ of the Galton laboratory, presents a series of the most elaborate statistical studies, nearly all bearing on the problem of trait-inheritance and its correlation with environmental factors. Provided the grist is good that is fed into this mathematical mill there can be little doubt but that the experts in charge of the machinery are competent to feed the multitude, hungry for eugenic loaves, with the best there is, in time.

Doctor Alexander Graham Bell (4a), whose work upon deaf-muteness will doubtless remain one of the classic studies in pioneer cacogenics is now engaged in research which promises to add a notable contribution to positive Eugenics in the near future.

Eugenic field-work, the getting material at first hand, is perhaps the most serious problem of the present day in this

order of research. A great deal of the work now being done will be valuable only as the clearing a stony field of its cumbrous population is of value. The field worker must now do his or her duty in the face of the fact that there are no adequate standards to measure that which should be reported feeble-mindedness, neuropathic make-up, special or general ability, etc. Normality is a word in common use among pedigree builders—obviously a blanket term, obviously arbitrary but certainly necessary until there be a better one.

Davenport (13) has brought together in book form the main lines of eugenic research, especially those started in America. Besides the tentative list already mentioned of abnormalities that will probably be shown to mendelize, he lists the inheritance of nearly a hundred specific diseases and abnormalities as well as typical cases of heredity in qualities such as eye color, hair color and hair form, skin color, stature, musical, mechanical, calculating, literary, artistic and memory abilities. An adumbration of future geographical charting of hereditary traits, already begun in a small way, and a suggestion as to the eugenic significance of migrations add a distinctly anthropological flavor to the whole subject and bring home to one the vastness of fields hardly yet touched that await the student of one of Eugenics' many branches. A glimpse at some of the work already under way in recording the notable traits in distinctive American families should lead the intelligent reader to see the value of the humblest family pedigree, wrought out with care and patience to be added to the growing mass of data from which the analyst and statistician of the future, if not of our own generation, shall glean the principles of clear eugenic laws.

With a great part of biology, a considerable section of psychology, and an increasing number of sociologists turning hereditywards there seems to be a sound foundation for the hope that the earnest investigations already under way are bringing us nearer the time when we shall have a working criterion of worth for each human strain and stock. The stamping and rating of humanity according to parental fitness is not impossible, say these workers, and just in proportion as we are led to share their faith and give them our co-operation, not without criticism, will the science of rational selection become real.

Selected Bibliography

1. Adami, J. Geo. The Principles of Pathology. Phila., Lea & Febiger, 1910. 1027 p.
2. Arner, Geo. B. L. Consanguineous Marriages in the American Population. N. Y., Columbia Univ. Press, 1908. 99 p.
3. Bateson, Wm. Problems in Genetics. New Haven, Yale Univ. Press, 1913. 258 p.
4. —— ——. Biological Fact and the Structure of Society. Oxford, The Clarendon Press, 1912. 34 p.

4a. Bell, Alexander Graham. Upon the Formation of a Deaf Variety of the Human Race. Mem. Nat. Acad. Sci., 1883, Vol. 2, pp. 179-262.

4b. Brown, Hon. Lathrop. On Heredity and Immigration. Congressional Record, 1914, Vol. 51, pp. 2729-2734.

5. Bertillon, J. La Depopulation de la France. Paris, Felix Alcan, 1911. 346 p.

5a. Castle, Coulter, Davenport, East, Tower. Heredity and Eugenics. Chicago, Chicago Univ. Press, 1912. 310 p.

6. Chamberlain, A. F. Eugenics: Monroe's Encyclopedia of Educ., N. Y., Macmillan, 1911, Vol. 2, pp. 514-518.
7. Chapple, W. A. The Fertility of the Unfit. Melbourne, Whitcombe & Tombs, 1903. 127 p.
8. Church, Wm. S. The Influence of Heredity on Disease, etc. London, Longmans, 1909. 142 p.
9. Conklin, E. G. Heredity and Responsibility. Sci. N. S., 1913, Vol. 37, pp. 46-55.
10. Constable, F. C. Poverty and Hereditary Genius. Lond., Fifield, 1905. 149 p.
11. Danielson, F. H. The Hill Folk. E. R. O. Memoir No. 1, Cold Spring Harbor, 1912. 56 p.
12. Darbishire, A. D. Breeding and the Mendelian Discovery. Lond., Cassell, 1911. 278 p.
13. Davenport, C. B. Heredity in Relation to Eugenics. N. Y., Henry Holt, 1911. 297 p.
14. —— ——. State Laws Limiting Marriage Selection. Cold Spring Harbor. E. R. O. Bull No. 9, 1913. 66 p.
15. Dawson, Geo. E. The Right of the Child to be Well Born. N. Y., Funk & Wagnalls, 1912. 144 p.
16. Dugdale, R. L. The Jukes. N. Y., Putnams, 1910. 120 p.
17. Elderton, E. M. Primer of Statistics. Lond., Chas. Black, 1909. 86 p.
18. —— ——. On the Measure of Resemblance of First Cousins. Lond., Eug. Lab. Memoirs, No. 4, Dulau & Co., 1907. 53 p.
19. Ellis, Havelock. The Problem of Race Regeneration. N. Y., Cassell, 1911. 70 p.
20. —— ——. The Task of Social Hygiene. Lond., Constable, 1912. 414 p.
21. —— ——. The Sterilization of the Unfit. Eug. Rev., 1910, Vol. 1, pp. 203-206.
22. Estabrook, A. H., and Davenport, C. B. The Nam Family. E. R. O. Memoir No. 2, Cold Spring Harbor, 1912. 85 p.
23. Fairchild, H. P. Immigration. N. Y., Macmillan, 1913. 455 p.
24. Féré, C. La Famille Neuropathique. Paris, Alcan, 1898, 352 pp.
25. Field, J. A. The Progress of Eugenics. Quart. Journ. Economics, 1911, Vol. 26, pp. 1-68.
26. Flick, L. Eugenics. Phila., McVey, 1913. 39 p.

27. Flood, E. and Collins, M. A Study of Heredity in Epilepsy. Am. Jour. of Insanity, 1913, Vol. 69, pp. 585-603.
28. Forel, August. The Sexual Question. N. Y., Rebman, 1908. 530 p.
29. Galton, Francis. Hereditary Genius. Lond., Macmillan, 1892. (First Edition 1871). 368 p.
30. —— ——. English Men of Science. Lond., Macmillan, 1874. 270 p.
31. —— ——. Inquiries into the Human Faculty. N. Y., Macmillan, 1883. 380 p.
32. —— ——. Natural Inheritance. Lond., Macmillan, 1889. 259 p.
33. —— ——. The Possible Improvement of the Human Breed under Existing Conditions of Law and Sentiment. Nature, 1901, Vol. 64, pp. 659-665.
34. —— ——. Eugenics; its Definition, Scope and Aims. Amer. Jour. of Sociol., 1904, Vol. 10, pp. 1-6.
35. —— ——. Restrictions in Marriage and Studies in National Eugenics. Soc. Papers for 1905, Lond., Macmillan, 1906, pp. 1-49.
36. —— ——. Essays in Eugenics. Lond., Eug. Ed. Soc., 1909. 109 p.
37. —— ——. Memories of My Life. Lond., Methuen, 1908. 32 p.
38. Goddard, H. H. The Kallikak Family. N. Y., Macmillan, 1912. 117 p.
39. Grassl. Zur Frage der Fruchtfähigkeit und der Mutterschaft. Archiv. f. Rassen- u. Gesellschafts-Biologie, 1908, Vol. 5, pp. 498-525.
40. Hall, G. Stanley. Educational Problems. N. Y., Appleton, 1911. 2 vols.
41. —— ——. Eugenics. Relig. Education, 1911, Vol. 6, pp. 152-159.
42. Hobhouse, L. T. The Value and Limitations of Eugenics. Sociol. Rev., 1911, Vol. 4, pp. 282-302.
43. Hodge, C. F. Experiments on Physiol. of Alcohol. Pop. Sci. Mo., 1897, Vol. 50, pp. 594-603.
44. Jordan, David Starr. The Blood of the Nation. Bost., The Unitarian Assn. Press, 1903. 82 p.
45. —— ——. The Human Harvest. Bost., Unitarian Assn. Press, 1907. 122 p.
46. —— ——. The Heredity of Richard Roe. Bost., Am. U. Assn., 1911. 165 p.
47. —— ——. War and Waste. N. Y., Doubleday, Page & Co., 1913. 296 p.
48. Kellicott, W. E. The Social Direction of Human Evolution. London, Appleton, 1911. 249 p.
49. Key, Ellen. Love and Marriage. N. Y., Putnam, 1911. 399 p.
50. —— ——. The Century of the Child. N. Y., Putnam, 1909. 339 p.
51. Laughlin, H. H. The Behavior of the Unit-Like Series. American Breeders' Association Ann. Report, 1912, Vol. 7, pp. 304-312.
52. —— ——. Eugenics Record Office. Report No. 1. Cold Spring Harbor, 1913. 28 p.
53. McCulloch, O. C. The Tribe of Ishmael. Indianapolis, Char. Org. Soc., 1891. 8 p.
54. McDougal, Wm. A Practical Eugenic Suggestion. Sociological Papers. London, Macmillan, 1907, Vol. 3, pp. 53-104.
55. Mental Deficiency Bill. London, Wyman and Sons, 1913. 47 p.

56. Mjoen, J. A. Effect of Alcoholism on the Germ Plasm. Problems in Eugenics, 1913, Vol. 2, pp. 182-188.
57. Morel, B. A. Traité des dégenerescences physique, intellectuelles, et morales de l'espèce humaine. Paris, Balliere, 1857. 700 p.
58. Moreau, J. La psychologie morbide, etc. Paris, Victor Masson, 1859. 575 p.
59. Morrow, P. A. Social Diseases and Marriage. N. Y., Lea Bros., 1914. 400 p.
60. Mott, F. W. Heredity and Eugenics in Relation to Insanity. London, Problems in Eugenics, Eugenic Educ. Soc., 1912, Vol. 1, pp. 400-428.
61. Nearing, Scott. Race Suicide vs. Over Population. Pop. Sci. Mo., 1911, Vol. 78, pp. 81-83.
62. Nice, L. B. Comparative Studies of the Effects of Alcohol on Reproduction and Growth. Jour. of Exper. Zool., 1912, Vol. 12, pp. 133-152.
63-69. Numerous Articles in the New York Medical Journal during 1913-1914.
70. Oliver, Thos. Diseases of Occupation. Lond., Methuen, 1908. 427 p.
71. Orchansky, J. Étude sur L'Hérédité, Normal et Morbide. St. Petersburg Mem. L'Academie Imp. des Sciences, 1894, Vol. 42. 210 p.
72. Pearson, Karl. Tuberculosis, Heredity and Environment. Lond., Dulau, 1912. 46 p.
73. —— ——. National Life from the Standpoint of Science. Lond., Adam & Chas. Black, 1901. 62 p.
74. —— ——. On the Inheritance of Mental and Moral Characters in Man and Its Comparison with the Inheritance of Physical Characters. Biometrica, 1904, Vol. 3, pp. 131-190.
75. Problems in Eugenics. Papers Communicated to First Internat. Eug. Congress. Lond., Eug. Educa. Soc., 1912. 2 vols.
76. Punnett, R. C. Mendelism. Lond., Macmillan, 1911. 176 p.
77. Reid, G. A. Alcoholism, A Study in Heredity. Lond., Bailliere, 1902. 293 p.
78. Rentoul, R. R. Proposed Sterilization of Certain Mental and Physical Degenerates. Lond., Walter Scott, 1903. 26 p.
79. Report of Committee on Immigration. Amer. Breeders' Magazine, 1912, Vol. 3, pp. 249-255.
80. Ribbert, Hugo. Rassenhygiene. Bonn, Friedrich Cohen, 1910. 65 p.
81. Rosanoff, A. J. The Inheritance of the Neuropathic Constitution. Journ. Amer. Med. Assn., 1912, Vol. 58, pp. 1266-1269.
82. Saleeby, C. W. Parenthood and Race Culture. N. Y., Cassell, 1909. 331 p.
83. Smith, T. L. Some European Institutions for the Protection of Motherhood and the Prevention of Infant Mortality. Ped. Sem., 1912, Vol. 19, pp. 101-111.
84. Stockard, Chas. R. An Experimental Study of Racial Degeneration in Mammals treated with Alcohol. Arch. of Internal Medicine, 1912, Vol. 10, pp. 369-398.
85. Swift, M. I. Marriage and Race Death. N. Y., Swift, 1906. 270 p.
86. Schuster, Edgar. Eugenics. Lond., Collins, 1912. 264 p.
87. Treasury of Human Inheritance. Eug. Lab., Lond., 1912. 573 p.

88. Thorndike, E. L. Educational Psychology. N. Y., Columbia Univ. Press, 1910. 248 p.
89. Van Wagenen. Preliminary Report . . . on the Best Practical Means for Cutting off the Defective Germ Plasm from the Human Population. Problems in Eugenics, Vol. 1, pp. 460-479.
90. Von Lundborg, H. Medizinisch-biologische Familien; Forschungen innerhalb eines 2232 Köpfigen Bauerngeschlechtes in Schweden. Jena. G. Fischer, 1913. 2 vols.
91. Wallace, A. R. Social Environment and Moral Progress. Lond., Cassell, 1913. 163 p.
92. Walter, H. E. Genetics. N. Y., Macmillan, 1913. 272 p.
93. Ward, L. F. Applied Sociology. N. Y., Ginn, 1906. 384 p.
94. Weeks, D. F. and Davenport, C. B. A First Study in the Inheritance of Epilepsy. Journ, of Nerv. and Ment. Disease, 1911, Vol. 38, pp. 641-670.
95. Weeks, D. F. The Inheritance of Epilepsy. Prob. in Eug., Vol. 1, pp. 62-99.
96. Wilcox. The Statistician's Idea of Progress. Internat. Journ. of Ethics, 1913, Vol. 23, pp. 275-298.
97. Winship, A. E. Jukes-Edwards. Harrisburgh, Penn., Myers, 1900. 88 p.
98. Whetham, C. & C. D. An Introduction to Eugenics. Lond., Macmillan, 1912. 66 p.
99. Woods, F. A. Heredity in Royalty. N. Y., Holt, 1906. 312 p.
100. —— ——. The Influence of Monarchs. N. Y., Macmillan, 1913. 421 p.

Note: An extensive working bibliography of eugenics and the inheritance of mental defect is published by the New York State Board of Charities, Albany.

TUBERCULOSIS AMONG SCHOOL-CHILDREN[1]

By George E. Jones, Clark University

Introduction

Tuberculosis, like the Poor, has been with man a long time, and the characteristic of that class, Poverty, has been and is one of the most important factors in the development of the disease. Though it attacks all classes, we believe with Jenkins (40), that it is pre-eminently "a disease of poverty." "As the prevalence of tuberculosis is the index of the living, housing, working conditions in a community, (56) so the improvement of these conditions will measure the decline of the disease." Pearson (66) has shown that the death rate from consumption has declined during periods of prosperity. The consensus of opinion seems to attribute the rapid fall in the death rate of Germany to their excellent Social Insurance (22) through which the economic status of the people, as a whole, has been improved (37).

Over 2,000 years ago, Hippocrates described the 'habitus phthisicus' and recommended attention to diet and manner of living in its treatment. Galen, though he attempted to find a specific in his youth, at the age of about 70, decided there was none and prescribed plenty of dry open air with milk and eggs for food. In the 16th Century, Franciscus Sylvius described tubercles in the lungs. Bodington suggested the use of Sanatoria in 1840. Robert Koch discovered the tubercle bacilli in 1882 (74). Since this discovery, it is possible to regard tuberculosis "as a chronic infectious condition, which may present itself as a disease but not necessarily do so." (33.)

Tubercle Bacilli

The tubercle bacilli are colorless, aerobic, slightly curved, probably non-motile, unflaggelate bacteria, varying in length from 1.5μ to 4μ and in width from .2μ to .4μ. They may occur in pairs, taking the form of a 'v.' Some authors have

[1] The author is deeply indebted to Dr. Burnham for suggesting this work and for help throughout its preparation. For the criticism and discussion of Dr. C. A. Osborne, in many phases of this subject he wishes to express his appreciation. He also owes much to the library force of the University for their assistance in collecting data.

attributed the degree of the severity of the disease to the differences in the size of the bacilli, others, to the number of bacteria present, while most consider the condition of the host, the most important factor. Once stained, these bacteria retain the color a long time, being of the ' acid proof ' group. They flourish best at the temperature of the human body though they have grown well at 60° F. They multiply by the process of fission. Some authors are inclined to think these bacilli produce spores but the evidence is very inconclusive. While man seems to form the best host for this parasite, other animals harbor it. At a certain Stock Yard, considered an average one, from 4 to 25% of the slaughtered were found infected. Milk and butter sometimes contain the organism. It is able to withstand the greatest cold we have been able to produce but 180° F. destroy it. Strong *sunshine* kills this bacterium in from one to twenty-four hours. Daylight tends to stop its growth and may kill it. Pure air lessens its vitality. (28, 46, 102.)

Types of the Disease, and Parts Attacked

The parts of the body most easily affected are, the lymphatic glands, bronchi, bronchioles, lung-tissue, pleura, joints, larynx, peritoneum, organs of excretion, intestines, bones, cerebral-meninges, muscles, nerve-sheaths and blood-vessel walls. The mouth, tongue, gums and palate, though occupying an exposed position, are rarely attacked and play a very minor part as a primary avenue of infection (72). The tonsils are more often affected and may furnish a primary channel for the invasion. The pharynx and aesophagus are practically never affected. Though the stomach is sometimes infected, it is probable that the hydrochloric acid in it for the most part prevents destructive action. The intestines furnish a much greater number of the primary infections. Especially is this true of children, for intestinal susceptibility varies with age (103).

The bacteria may first appear in the surface of the lining of the bronchial tubes, extend to the submucous tissue and then enter the lungs. Or they may be taken into the alimentary tract through which they pass without making a lesion, especially during the digestion of fats, into the lacteals and thence into the circulation until they reach the lungs, where by a process of filtration, they may be retained. The bacilli may get into the circulation, grow in the kidneys, lodge in the trachea, get into cuts and abrasions, or into the alimentary tract, where they may produce ulcers of the intestines.

In general, the bovine species of tubercle bacilli, is responsible for bone and glandular tuberculosis. The human species gives rise to the pulmonary types.

The upper part of the right lung is usually first affected, then the apex of the left lung followed in order by the kidneys, joints and tendon-sheaths. The joints may swell and the patient think he has rheumatism. Some forms of pleurisy are varieties of tuberculosis. Contact tuberculosis is sometimes found among physicians and nurses. It is due to exposure while working with tuberculous patients.

Laryngeal tuberculosis may take two forms,—one mild, the other often fatal. In the first, the patient loses the power of speech, perhaps at least the vocal cords are affected. In the second the arytenoid region is affected, the patient is unable to swallow, speak well and in most cases soon dies.

Tubercular cerebral meningitis, usually found in children, has always proved fatal so far as we can find.

Of the many forms tuberculosis may take in the lungs, the chronic-ulcerative, acute and fibroid are considered the most dangerous. The so called 'galloping consumption' is found among these three. Its pace does not conform to its name. Lung tuberculosis is frequently accompanied by a middle-ear infection, the ear-drum becomes inflamed and various local troubles may be found. The mucous membrane becomes affected and soon the larynx.

Some of the diseases secondary to consumption, that is the result of it or of its attack upon the body are; skin affections, such as scrofula, forms of bone trouble, swelling of the joints, peritonitis, Bright's disease and pericarditis.

Of those having tuberculosis of the skin, joints, bones, glands, serous membrane or encysted nodules in various parts of the body, a large number recover. Especially is this true of children who have skin troubles of this nature. They generally recover and show few if any symptoms of having been afflicted.

Pulmonary patients whose tissues are practically normal, these of course including the blood, even though they may have occasional slight hemorrhages, are most likely to recover. The widespread idea that hemorrhages are fatal is unwarranted for in most cases they are not, and may be a help rather than hindrance.

Children of the age of twelve or thereabout, whose lungs are affected, may continue to have the disease and yet live to an old age. The mortality rate from 18 to 25 years of age is very high, due perhaps to the adolescent strain completing its cycle. People of from 30 to 40 years of age, who

take the disease during this period, have the best chance of recovery. Their mental balance is an important factor in staying off the attack and progress of the bacilli.

Causes

The growth of tuberculosis in the human system is due to the *lowered vitality* of the individual (28, p. 145), (93, p. 26, 36, p. 37, 31, p. 59). "Only vital, thoroughly healthy tissue is capable of furnishing a barrier against the propagation of the infection" (79, p. 157). "The micro-organisms can not harm us so long as our organism functionates properly; they are harmless if the defensive measures of our body are in good condition" (79, p. 260). "Hence, not the tubercle bacilli should be combatted, but the deficiently functionating part of the general activity must be removed which creates the predisposition to endoparasitism" (79, p. 453). Though the writer agrees with the ideas of the author of above quotations, he sees no reasons for not reducing the number of bacteria where possible and hence thinks we should combat both, poor functionating and the bacilli.

This *lowered vitality* of the individual may be brought about by the following causes: 1, Heredity; 2, Diseases; 3, Some Occupations; 4, Starvation; 5, Fatigue; 6, Bad Air; 7, Certain Habits, and 8, Certain Mental States.

Jordan (42) believes that tuberculosis is hereditary, due to the absence of some factor or determinant in the germ-plasm which brings about a susceptibility or tendency to take the disease. For a disease to be hereditary, it *must be* or *become* part of the germ-plasm. We have no evidence that the bacilli ever fuse with the spermatazoon or ovum. Hence the disease is due to a foreign agent and not heredity (36, p. 12). From the evidence we have, we are led to the conclusion of Adami, "There is no such thing as inherited small-pox, inherited tuberculosis or hereditary syphilis" (64, p. 22, 87, p. 481-489, 55).

Landouzy and Laederick, by a series of experiments performed on dogs, rabbits, and guinea-pigs, attempted to discover whether the tubercle bacilli are transmitted from the tuberculose parents to their offspring. In the first series, they found bacilli in only one fetus. In the second, none of the dogs or rabbits were affected but 16 out of the 68 guinea-pigs showed tubercular lesions. Of the 10 offspring of the third series, but one showed a lesion. The conclusion was that tuberculosis might be contracted, though rarely, in-utero (57), (50, p. 231-3). Achard says congenital tuberculosis is only possible where the placenta is pathologically altered and that

in all cases on record, the mother and child have died at or within a few weeks of the delivery (8, p. 11). So few is the number of congenital cases, this means of transmission may be practically ignored (43), (36, p. 45).

Among those who claim there is an inherited diathesis or predisposition to the disease (9), Pearson is one of the most strenuous. "It is the *all-important* genetic fact that the diathesis of pulmonary tuberculosis is *undoubtedly inherited*" (67). He thinks that infection plays a very minor part and finds that "the marriage of the actually tuberculous is less productive of evil than the marriage of those of tuberculous stock." Yet, "the bulk of the tuberculous belong to stocks which we want ab initio to discourage" (68). Hence, he recommends the regulation of marriage as the only means of getting the disease under control. "For the artizan class, the inheritance factor is far more important than the infection factor, because in a very large proportion of cases, it does not lie in the power of the individual to maintain in the stress of urban life a wholly safe environment."

Pearson uses the statistical method only. It is very doubtful whether, when thus used, it can shed much light on the nature of such a complex biological phenomenon as inheritance. His data and conclusions differ much from those of a large proportion of investigators in the same field. If he were able to give criteria whereby the tuberculous could be distinguished from the non-tuberculous stock, his statements and suggestions with reference to marriage might be properly evaluated. But since, as he states, practically every one is attacked at some time, the 'bulk' of mankind must be of tubercular stock,—a rather broad and absurd conclusion. That inheritance is the most important factor is not the logical conclusion of the fact that one may not obtain a perfect environment.

"Inasmuch, therefore, as *normal* heredity must needs have been in existence prior to *morbid* heredity (36), it is obvious, we have under discussion the heredity transmission of acquired characters derived from external causes." All biological evidence is against the modification of the germ-plasm in any such way. The "normal man is little predisposed to tuberculosis and leprosy,—" (31, p. 59, 36, p. 107). Dr. Bridge says, "The fact of his parents having had the disease, *presumes* a reduced power to resist it on the part of the individual. It *presumes* but does not prove."

What then shall be said of the part played by heredity in the Lowering of Vitality?

First, as such it has nothing to do with the transmission of the disease.

Second, congenital heredity takes place in so few cases that it may practically be ignored.

Third, anything which seriously effects the soma-plasm or germ-plasm, for good or ill, may modify the germ-plasm and by so doing give to the new organism a greater or less impetus to normal functionating and development. In this sense, then, the organism may inherit a weak mechanism but not a predisposition to the tubercle bacilli.

Because they impair normal functionating, measles, bronchitis, whooping cough, prolonged summer complaint, scarlet fever, and typhoid fever are often followed by tuberculosis. Any disease or injury may leave the body with such a reduced power of resistance that it is susceptible to the bacilli (95, p. 279, 34, 105, p. 470-1). Though the vitality of the young is greater in amount than that of the adult, it fluctuates much more and hence the occasions when the youth are susceptible to attack are more numerous.

In regard to starvation, attention needs to be called to the fact that too much as well as too little food is its cause. A surplus amount taken into the alimentary tract may prove of such a clogging tendency to the whole system as to materially lessen its ability to functionate. It would seem that although the subject of feeding is a complex one, and the conclusions of laboratory experiments conflicting, the principles involved in the feeding of cattle and stock of all kinds, since they really work in the laboratory of nature, could be applied to some degree in the feeding of men. Under the advice of a competent physician, one should take food containing the elements lacking in his constitution. Though no universal prescription can be given as to what the general public should eat, this can be given, have the food properly cooked and clean.

Coal-mining, glass-blowing, textile industries, stone-cutting, printing, painting and those occupations where there is poor air, poor light and poor sanitation are very likely to lessen vitality. Yet the important fact for the teacher and the general public is that *any* occupation may be carried on in such a manner as to make the body a hospitable habitat for the bacteria. Long hours, continuous strain, fixed position, may cause some vital organ to functionate imperfectly and thus put a strain on the whole organism.

In the school room, exacting requirements with reference to the position of the pupil in writing, standing, sitting, method of work or time given to particular tasks, may lead to

a weakening of the defensive powers of the body. Play and the recess are essential parts of the curriculum. Experiments in the industrial world and in the school room have proven that frequent periods of rest promote efficiency in every way. The insistent demands upon the unstable vitality of the child account for the high death-toll of child-labor.

The presence of the fatigue toxin in the system puts an extra demand upon it and thus weakens its resistance.

The high rate of mortality, due to tuberculosis, in the teaching profession, is startling. It has been reported (96, chap. 3) that the tuberculous death rate of the teachers of Saxony exceeds that of the general public, at the ages from 20 to 29 by 60%, from 30 to 39 by 23%; of Switzerland, from 20 to 29 by 10%, from 40 to 49 by 30%. For every 1,000 dying of all causes, the following are reported as dying from tuberculosis in the province of Ontario:

"Stonecutters	650 (65.0%)	Male Teachers	99 (29.9%)
Printers	608 (60.8)	Lawyers	250 (25.0)
Female Teachers	570 (57.0)	Physicians	180 (18.0)
Seamstresses	406 (46.6)	Farmers	160 (16.0)"

"Statistics for the United States indicate a higher tuberculosis mortality for the teaching profession than for the notoriously unhealthful occupations of stone-cutter or saloon-keeper." Probably the two most important causes of this are, bad air and lack of sufficient and proper exercise in the open air. Some of the factors responsible for the bad air are: poor ventilation, too high temperature with two low humidity, and dust particles of all sorts such as must circulate where crayon and pencils are used and people live.

Lowering of vitality may arise from drug habits, alcoholism, indulgence of the passions, irregular habits of eating and sleeping, excess in the use of tobacco and articles of diet such as tea and coffee, and over-stimulation. Though most people err on the side of taking too little rather than too much exercise, it should be said that too much and too strenuous play may have the same effect as over-stimulation. For this reason, athletes, who have developed one set of muscles at the expense of another part of the body or the whole system, are more subject to this disease than those persons of spare musculature but normal organic vigor. The American ideal of specialists in sports should be discouraged for the sake of the athlete himself and for the sake of true sport. Especially is this true for the school children. The real purpose of play is to rest man, give him pleasure and promote the proper action of his whole body,—not to win medals or prizes.

For many years it has been known that the mind has much

to do with health but only in recent years have physicians and laymen taken this into account in the treatment of disease. "As a man thinketh, so is he" is trite but true physically as well as morally. When one is discouraged, in trouble, grief or fear, the respiration is affected, the heart may refuse to beat normally, the glands to secrete properly and the vital organs to work at their best. Thus the invasion and growth of the bacilli is encouraged.

A wrong attitude on the part of the public has seriously interfered with the recovery of those afflicted and the lessening of the number of new cases. It has been too prone to look upon those manifestedly tuberculous, as outcasts, who should be shunned, considered pests and of degraded origin. If this is true, it is not a case for throwing stones for practically all are in the same class. Some authorities claim that from 40 to 50% of the race, not only harbor the bacteria but already have tuberculosis in some form. Dr. Cornet says, "The consumptive himself is almost harmless and only becomes dangerous through bad habits." Knopf tells us that "a clean conscientious consumptive is as safe a person to associate with as anybody" (74, 48, 104).

There is no need to be alarmed over the ubiquity of the bacilli. For while it is debatable as to whether bacteria are an unmitigated curse, it is probable that they have their proportionate share of enemies with which to contend and it is known that under favorable conditions, they, in their growth may make such an unfavorable environment for themselves that they perish (17).

We may therefore "presume for all practical purposes that the disease is always acquired from without, from bacilli taken in from the atmosphere or with food and drink." Climate, in general, has little if anything to do with the taking of the disease. It must come for the most part from human sources, possibly from milk and sometimes from butter. At the present time there is considerable difference of opinion as to whether cattle, milk and butter are major or minor sources of infection. The general conclusion of our investigation is that children are sometimes infected through the bovine bacilli and adults less often.

Symptoms

The symptoms (46, 64, 8, 9, 95, 104) of the disease do not manifest themselves early, and for this reason it is often allowed to run a long time before it receives the attention that it should. The first sign is usually a lowered vitality accompanied by a cough and slight hemorrhages. In children this

cough is usually most marked in the morning. Loss of weight, strength and appetite soon follow. The digestion becomes poor, gastric discomfort takes place and diarrhoea or constipation may be present. Fever follows quickly. Rarely is there a pain in the lungs though the patient may locate it there. In this case it is in the pleura or walls of the chest or both. The temperature of the patient may rise followed by a chill. It is highest in the afternoon and evening and when it falls, the patient may perspire a variable amount. A small amount of blood in the sputum is probably more beneficial than harmful and is not to be considered dangerous.

If one lung is more affected than the other, the patient will cough more when lying on that side. As they should always avoid any but the gentlest cough, they in this case had better sleep on the opposite side. There may be vomiting. The rate of progress is usually slow but varies much. Pulmonary tuberculosis is remarkably painless. The patient becomes short-winded. There may be a wheezing or rattling sound in the chest, swallowing become difficult, the liver swell and the sexual organs become affected.

Tuberculous children are usually of a delicate build and narrow chested. They have small hearts with rapid action, feeble circulation and often abnormal throat and nasal passages. Accompanying the cough before mentioned, will be excessively bright eyes and red spots in the center of the cheeks or more often in the center of one cheek. Especially is this true at the beginning of the morning session of school. One side of the chest may expire more than the other, or one side may be sunken in more. In noticing this difference in respiration, it should be noted that all do not breathe alike. For some breathe much more with the lower part of the chest than others and this may lead to a mistake in diagnosis. In case the left lung has become contracted, we may be able to see the heart pulsate above its normal position. The expansion of the chest is always considered. It, however, is not a sure symptom for some tuberculous persons have an expansion above the average.

Frequency

In an examination of school children from 13 to 14 years old, Dr. Ito (92) found 47.2% of the boys and 50.5% of the girls tuberculous. The inference has been drawn that probably one-half the Japanese school children are infected.

Harbitz (49) found 42.5% of the school children of Christiania tuberculous.

TABLE I

FREQUENCY OF TUBERCULOSIS AMONG SCHOOL CHILDREN

SECTION A.—GERMANY AND AUSTRIA-HUNGARY

Autopsies are marked a. Ages included are between vertical bars. Where datum is lacking, space is blank.

No. of Case	Bibliography	PLACE	PERCENTAGE OF TUBERCULOSIS OR LESIONS FOUND												
			Ages	4	5	6	7	8	9	10	11	12	13	14	
	97	Vienna										68			
	..	Vienna										94			
509	66	Vienna		32	52	51	61	73	71	85	93	95	94	94	53
	..	Vienna													90
	44	Prag	1st.			90						70			
	91	Prag				57						70			
	90	Dortmund													75
	..	Dortmund													50
	32	Sachsen													26
	8	Berlin													20
	97	Berlin										53.7			
	4	Berlin			54	53.1						63			
	32	Berlin			36									64	
	97	Düsseldorf													84p
	34	Düsseldorf													46
	97	Dantzic										74			

TABLE I—Continued

FREQUENCY OF TUBERCULOSIS AMONG SCHOOL CHILDREN

SECTION A.—GERMANY AND AUSTRIA-HUNGARY—Continued

Autopsies are marked a. Ages included are between vertical bars. Where datum is lacking space is blank.

No. of Case	Bibliography	PLACE	PERCENTAGE OF TUBERCULOSIS OR LESIONS FOUND												
			Ages	4	5	6	7	8	9	10	11	12	13	14	
	97	Munich										60			
1798	39											42			
	2											75			
	34	Altona													92
2594	44	Altona													53
..	..	Altona													78
	34	Altona													52
	32	Springe													29
650	35	Springe													27
496	2					61					75				
	91											53			
	105														27
	..														70
	32	Villages													22p
	..	Villages													80
2000	27													53	

	99																	70
693	66	Vienna				17			35			55						
	..					47			57			70						
	..					36			47			51						
	..					51			71			94						
150	..	Vienna																21
	..	Kiel																20
806	..	Berlin																18
	..	Berlin																65
	..																	70
	..																	60
3213	86	Vienna a	(1st.	year to		61						50						
500	66	Munich a						Schoo l age				42						
	66	a																75
	32	Berlin a										65						
1800	66	a				27			27									
1820	66	a																60
	66	a				56			63			70						
88	..	a																17
93	..	Budapest a																69p
190	..	a																38
973	..	Prag a																24
401						60			64			77						

TABLE I—Continued

FREQUENCY OF TUBERCULOSIS AMONG SCHOOL CHILDREN

SECTION B.—FRANCE

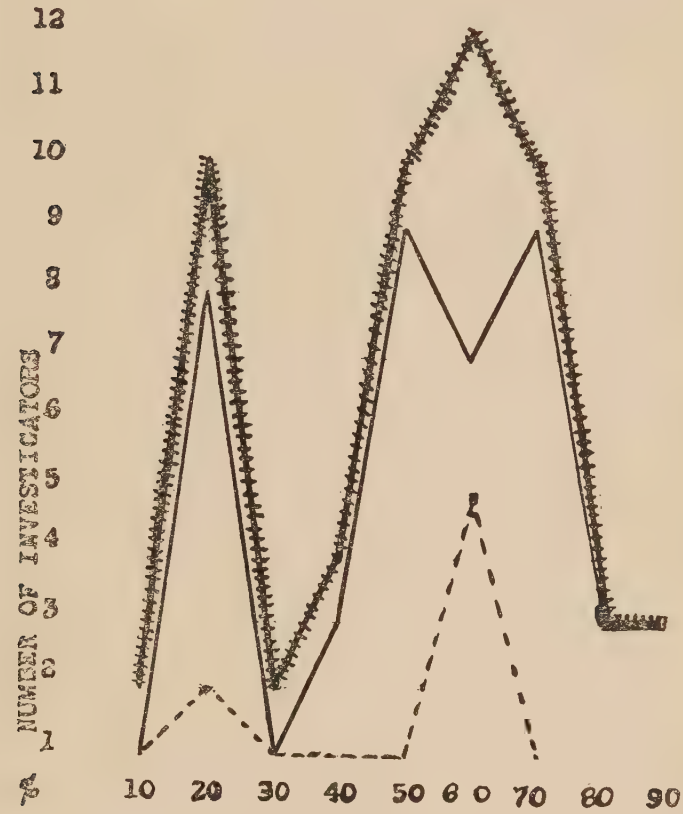
Autopsies are marked a. Ages included are between vertical bars. Where datum is lacking space is blank.

No. of Case	Bibliography	PLACE	PERCENTAGE OF TUBERCULOSIS OR LESIONS FOUND												
			Ages	4	5	6	7	8	9	10	11	12	13	14	
	44														20
	..														30
876	..														16
	77	Paris													90
685	86	Paris.....a	(1 year old 16%)												
327	..	Paris.....a	(1st. and 2nd. years 43%)												
	66	a	2nd. year to				67				64 to	16th.	year		
435	86	Paris.....a	(2nd. year on 65%)												36
315	44	Paris.....													80
447	..	Paris.....													24

FREQUENCY

GERMANY AND AUSTRIA-HUNGARY

Curves representing the number and results, in per cent, of investigators.



————, solid black line, represents tests upon live children,—clinical, Pirquet, Moro, etc.

— — — —, dotted black line, represents the results of autopsies performed upon children.

—|—|—|—, hatched line, represents the combined results of the autopsies and the other tests.

Section B of Table I indicates, to some degree, the extent of infection among the school children of France. One author (57) finds that about 10% of the children become infected the first year and from the age of 5 to 15, 50%. This rate increases with age so that at death, practically all have been infected. The tables indicate that from 45 to 50% of

the children of school age are infected. France has a very high mortality rate. Though the rate of infection increases with age, the mortality rate decreases. The clinical and the results of autopsies agree very closely.

In Germany and Austria, medical inspection in the school has reached a plane of efficiency far beyond that of any other countries investigated. The strong centralized government, with its national system of education, probably allows of a better co-ordinated and organized system of inspection than is possible in such countries as England and the United States where small sections of the country are almost autonomous in some respects. This inspection, with the co-operation of various organizations and departments, has made possible a review of the prevalence of the disease as shown in Section A of Table I. The importance (62) of the German Social Insurance Act (22) in directing attention of the public and municipalities to proper conditions of work and living can hardly be over-estimated. Discovering that most of their losses in life and money were due to tuberculosis, the people, with characteristic German thoroughness, proceeded to find how big a problem the disease was and how they might solve or simplify it. As a partial result, they have a decrease in the death rate and an increase in the working efficiency of the members.

A glance through Table I will give an idea of the prevalence of the infection. While the average of all the data obtained is 55%, the graph (see p. 75) shows that a large majority of the investigators find over 60% of the children infected.

The data for Germany and Austria-Hungary show that while few children are affected the first year, by the age of 14, practically all have become infected. This infection may be active, latent or may never develop pathological conditions. The death rate of the disease varies from 12 to 65% of the total death rate. It seems to vary inversely as the rate of infection. The fact that almost all children are infected, and that the adult disease generally has its source in a childhood infection, would tend to support the view of those who claim that tuberculosis is pre-eminently a child's disease, and would indicate that the time to fight it most successfully is at this period of life (34).

In an examination of 806 children at Brighton, England, one physician found only 3, that is .37% tuberculous. What the nature of his examination was, the writer does not know. The smallness of this percentage is remarkable. A group of investigators (72) found in autopsies performed upon 1,560 children, 18.6% with primary infection of the intestines.

To this number must be added those with primary infection of the glands, lungs, etc. Walsh (101) in an examination of 207 cases found 65 actually tuberculous and 142 pretubercular. This means that 31% were actually tuberculous and 69% in a suspicious or fit condition for the development of the disease. Squire (87, p. 373-5) after an examination of 1,680 London children, announces that the percentage of infection as ordinarily given, is too high. Here again the thoroughness of his examination is not known. He seems to think that great error arises from calling symptoms tuberculous that are not. It should be said that most physicians think the error is far more often the other way. The high death rate from this disease among children, indicates that a more thorough investigation of its frequency is needed (25). From 1900 to 1909, in London 36% of the deaths from infectious disease including tuberculosis, was due to this disease. The percentage which was 36% in the first year of life mounted to 91.8% in the 14th, and from ages 15 to 20 was 96%. Dr. M'Neil in Edinburgh, found 14.1% out of 371 children one year old and (49) 46.6% out of 170 boys from 4 to 5 years old, tuberculous.

The figures presented for England, though perhaps a little less, approximate those of other countries. Several investigators or authors are of the opinion that the percentage infected in England is given entirely too high. They however give practically no data on which they base this conclusion. Reliable statistics of actual conditions are few. England (32) has the lowest death rate from tuberculosis of all the large nations. There may be a correlation between this fact and the low percentage of infection found among school children by some. Pearson, writing in England, seems inclined to accept the results of the German investigations and to infer that infection is practically universal.

For the purpose of finding the frequency, methods of combatting and condition of tuberculosis among the school children of the United States, letters were sent to the state boards of health of every state. Thirty-four replied. No data with reference to frequency were received. Even the death statistics were conceded to be unreliable and unsatisfactory. The Boards are doing all in their power to find and put into execution a satisfactory solution of the problem but the States as such are doing practically nothing. Some of the means employed by the Boards are the issuance of bulletins and pamphlets which are placed in the hands of teachers, boards and public, lectures and traveling exhibits. Some states provide free examination of sputum. Many have required registra-

tion of tuberculous cases. Regulations regarding spitting and sanitation are reported. Almost all of these are decrees of the State Boards. Several States require special instruction on the subject of tuberculosis in the Physiology and Hygiene courses in the public schools.

Minnesota law provides that " No principal, superintendent, or teacher and no parent, master or guardian of any child or minor, having authority to prevent, shall permit any such child or minor, having . . . tuberculosis . . . to attend any public school . . ." But the *primary diagnosis* of the trouble depends entirely upon the teacher. Thus no adequate system of detection is provided and absolutely no provisions are made for the inspection of the teachers or in the preparation of them for this medical work.

One State reports that a former Governor vetoed a Bill providing for the ascertaining of the extent of the disease in that State and also that the " efforts of the Christian Scientists and an organization known as The League for Medical Freedom, have prevented thus far the operation to any satisfactory degree, of the Medical Inspection Law for School Children."

To the writer, Pennsylvania seems to have coupled with a sane law, a reasonable means for its enforcement. Applicants for a teacher's certificate must first pass a satisfactory medical examination. (School Laws, Code Sec. 1320 and 2226) Section 1509 of Code, excludes, tuberculous teachers, pupils, janitors, or any employees from any public school except such as may be carried on under the direction of the Commissioner of Health. Physiology and hygiene must include instruction in tuberculosis and be taught in all the public schools and educational institutions supported in part or wholly by the state. (Sec. 1609) Minimal amount of air space to each pupil, control of heating, lighting, ventilation and general sanitation must meet specified requirements. To accomplish these measures, a system of Medical Inspection is provided, which is made compulsory in first and second class districts and is optional in third and fourth class districts. In 1911-12 about 800 inspectors were used in the Fourth Class Districts and their report shows that they examined 145,499 children, that is about 84% of those enrolled in such districts. They found .23% tuberculous. It is not shown that any provisions have been made for taking care of those pupils and teachers found to be tuberculous. Nor is it shown whether the disease found was of the Open or Closed type.

The figures for these districts indicate that about 216 pupils

should be examined per inspector and that they succeeded in examining about 182.

Another State reports that some of its County Superintendents have interested themselves in the problem of tuberculosis and have attempted to find its status. How they succeeded was not stated.

In no state, with the exception of Pennsylvania, were there any provisions made for the inspection of rural and village schools.

An attempt was made to get information from those cities supposed or reported to have medical inspection of their schools (85). Five failed to reply, nine had no data to offer on the frequency of the disease and eight gave partial reports.

Erie, Pennsylvania, reports they find .4 of 1% tuberculous and they take care of these in open-air schools.

Oakland, California, reports .1 of 1% Open and from .5 to 1% Closed tuberculosis. But as diagnosis is made only upon very strong evidences of the disease, this percentage probably fails to get a large number of the latent cases.

During the year (1912), Philadelphia had a total of 39 cases, 9 lung and 30 glandular. Besides these, they had 129 in the open-air schools who were suspiciously if not positively tuberculous. In view of the fact that examinations are made without removing clothing or taking temperature, they infer that many cases of latent tuberculosis are not diagnosed.

While presenting no figures, having careful inspection this year 1912, for the first time, Oshkosh, Wis., thinks the number of tuberculous small.

Chicago reports, "The examinations made were *necessarily* more or less *superficial* because we were not permitted to undress the children for the purpose of making a thorough physical examination nor were we permitted to take temperatures or resort to any other physical method of examination." Such data as they reported, follow:

Year	1907	1908	1909	1910	1911
Number examined	377,599	499,046	647,842	820,655	.....
Number tuberculous	9	72	29	9	11

The fact that Jones' (41) investigation was only "as careful as circumstances would allow" probably accounts for the remarkably low per cent, .1 of 1%, he found, even though he limited his investigation to the pulmonary type.

Table II represents the results of investigations in various parts of the country:

TABLE II

Number Examined	Bib.		Per-centage	Number t.b.
492	26	Richmond, Va., 3 and 4 grades, white.	21.0	
Not given	57	Place not given, exposed to infection through parent, etc	20.4	
500	26	Place not given, parents tubercular	20.0	
Not given	26	Boston		5000
Not given	75	Boston, committee, found pulmonary		133
Not given	..	Boston, committee estimated not over.		250
220	66	Boston	16.0	
Not given	26	New York City, parents tubercular	51.0	
Not given	98	St. Louis, probably should exclude		900
Not given	73	New York City, Oct.,1911, deaths, Pul.		3
		Type, cases		83
Not given	10	New York city, of entering clinic	45.0	
3000	41	Not given, pulmonary tuberculosis	.1	
Not given	99	Not given	45.0	
Not given	..	Not given	60.0	
Not given	..	Not given	80.0	
Not given	70	Not given before 15 years old	75.0	
Not given	86	Albany, over 6 years old	45.0	
Not given	..	Albany, over 2 years old	34.0	

A report from North Carolina (14) indicates that 85% of the people will become infected, have the disease and recover 95% will be infected or have the germs in the body during life.

Facts Brought Out by Investigation of Frequency in School Children

The data indicate that from .1 of 1% to 95% of the school children of the United States and England are tuberculous. A probable explanation of the discrepancies of the estimates follows:

Some of the investigators give no information as to the nature and extent of their inquiries. They are content to give "estimates" without their basis. Especially is this true of those who find extremely low percents. A statement that an examination of 3,000 children was "as careful as circumstances would allow," gives no idea of the value of the results. Other authors fail to make plain whether they have tested healthy or sick children or both or only the latter. And some

have generalized from results they have found in those anemic or below normal. There has been no agreement in the method or character of the investigations.

The diagnosis of tuberculosis, especially the pulmonary type in its incipient stage, is difficult. The disease may be latent for years, giving no pronounced indications of its presence. The consensus of opinion is that the disease of the adult is the result of childhood infection. In view of the differences of opinion as to the interpretation of symptoms at this age, varying estimates are to be expected.

Those who found low percentages of infection, with no exception so far as could be ascertained, considered *only* pulmonary tuberculosis. As this does not manifest itself early, only serious and pronounced cases would be detected. Furthermore, the pulmonary types form but a small part of the total number of cases.

Though the glandular cases are the most numerous; they have apparently not been considered by some investigators in England and the United States. It seems well established that even pulmonary tuberculosis is due, in many cases, not to a *primary* infection of the lungs, but to a weakened condition brought about by improper functionating of *priorly* infected glands. The figures for one city show 30 cases of glandular and 9 of lung tuberculosis. That is 76.9% of the cases were of a type practically ignored by a number of English and American investigators. Were these properly investigated, there seems no doubt that the lower extreme of the estimates would have to be raised materially.

The data from the cities having medical inspection gave some interesting facts;—

In almost every city, the teacher must first examine the pupil and upon finding him ill, send or report him to the medical inspector who then makes a diagnosis.

In one city, if the parents object, the medical examination may not be made unless the principal demands it.

Another city supposed to have medical inspection, reports that it does not, but that it has five nurses to look after the health of the children. A few cities seem to depend upon nurses for diagnosis, a subject for which the nature of their training does not fit them. Thus statistics from such sources as to frequency are unreliable.

The nature of the examinations as conceded by several inspectors, did not allow of a complete diagnosis nor of a full report of the situation. They were not allowed to remove the clothes for the physical examination nor were they permitted to take the temperature. A mere look at the pupil

was allowed which indicated that practically no diagnosis was made and only those pronouncedly tuberculous found.

In one city, 92 inspectors, physicians, spend three hours each school day of the ten months of school, in inspection. Each inspector has charge of 9,000 pupils. They have done the best they could. The result has been that out of 603,455 children in average attendance, but 287,871, that is 47.7% were examined during the year (59, p. 112).

These facts show that all of the children are not inspected and that those who are, receive, in most cases, a very superficial examination. Data from such sources must be unreliable and incomplete.

Mortality statistics afford no criterion of the number infected. The fact that England has a lower death rate than France does not indicate that her people are less tuberculous. Some races, the Jewish for example, seem to have developed a high degree of immunity. Other races, as the Indian and African in America, quickly succumb to the disease. Thus while the percentage of infection may be the *same*, the mortality of one is much less than that of the others. A generalization for the whole can not be made from one country, city or locality.

As has been shown, the results of autopsies and examinations made in Germany and Austria, practically agree. The same is true for France. In England and the United States, the results of autopsies indicate the number of tuberculous far in excess of the lower limits of the estimates. From the total data, it seems that the percentage is near the middle of the extremes of the tables and for the United States between 40 and 50.

More data are needed and an attempt should be made to standardize the conditions under which they are obtained.

With one exception, no effort is being made at medical inspection in the rural schools of the United States. As the rural pupils form such a large percent of the total school population, they should receive much more attention in this and other lines.

Treatment

Badaloni (3) claims that 'hidden,' closed tuberculosis is non-contagious and that 'open' tuberculosis is. Practically no difference is made in the treatment of the two forms.

Those consumptives having fever should not be allowed to take strenuous exercise, for this increases the fever and thereby impairs the functionating. With these patients, the condition of the mind has more to do with the progress of the disease than in those without the fever.

Feverless consumptives should exercise but never to excess. The object of this exercise is not to build muscular tissue, to make one strong or an athlete in the common acceptance of those terms, but to cause the organs to perform their functions properly. Public speaking and singing should not be indulged in by those openly tuberculous. Plenty of fresh air direct from out-doors and not through some conduit, should be taken. Windows should be open day and night, hot and cold weather. There is little reason to fear drafts (16).

Diet should receive careful attention. It has been found in the open-air schools, that it is not enough to merely furnish the schools. But, for the pupils ill-fed or not fed enough at home, it is necessary to provide food. All the children, in addition to the regular meals provided by themselves, are supplied in many schools with lunches, morning and evening.

Since leucocytes (78) are very inimical to tubercle bacilli, anything which increases the number and vigor of the former will tend to cancel the effects of the latter and to destroy them. Proper food will do this. Stale or toasted bread taken with something that will increase the flow of saliva, tender meats of almost all kinds, butter, eggs and milk are such foods. For the sick, it is better to pasteurize but not sterilize the milk. To aid in the increase of corpuscles and also in digestion, various acids are used. These should be taken only under the direction and advice of a physician. In some cases, a fruit—pineapple, for example—will take the place of this acid in digestion.

Changing climate will rarely do any good, especially if one has to return to previous environment. The chief benefit is a psychical one, for the patient is buoyed up by the hope of recovery and this, as has been shown, is a tonic in itself.

The probabilities are that cod-liver oil and similar prescriptions serve as foods, not as antidotes. Alcohol was formerly given but of late years has few advocates. To sum up, there is no universally accepted *specific*. In the search for such, numerous serums, vaccines, tuberculins and methods of administering them have been devised. The tuberculins, so far, have given the best results and have proved of great benefit in many cases. They seem to offer a suggestion as to the field of investigation for a specific (13, 12). There is little doubt of their great diagnostic value.

Probably the most used methods of administering tuberculins for diagnostic purposes are those devised by Moro, Wolff-Eisner, Calmette and von Pirquet (86).

Moro applied the tuberculin in the form of an unction to a freshly made abrasion.

Wolff-Eisner and Calmette, working separately, invented at about the same time, what is called by the former the 'conjuctival' and by the latter the 'ophthalmic' test. This consists of dropping tuberculin in the eye.

The Pirquet method, probably the most used of all, consists of making about four scarifications on some part of the body, as the forearm, leaving one scarification as a check and introducing tuberculin into the remainder (69). It is very sensitive and is very seldom followed by complications.

In all of these methods, the effect of the introduction of the tuberculin is noted, the color of the wound and the surrounding region, the nature and extent of inflammation, if any, and such other changes as may occur. From these data the diagnosis is made.

In advanced cases any or all of these tests often fail. Or where the patient is suffering from some infectious disease as scarlet fever, measles and diphtheria, negative reactions occur (58). They are of special diagnostic value in childhood.

Tuberculins are of two general types. Extract of the proteid of the tubercle bacilli combined with glycerine forms the main constituent of one type (80). In the other type living bacilli are used. Piorkowski, some years ago, inoculated turtles with the human bacilli and later took bacilli from these inoculated animals and made his tuberculin. The theory that the virulence of the bacilli is diminished by their abode in the cold-blooded animal was the basis of his work. He aimed to produce an avirulent type of the bacilli. Friedmann (1), on the basis of Piorkowski's work, experimented with tuberculin in the United States in 1912-13 but with no positively pronounced results. There is great danger in the introduction of living bacilli into a bacterium-free body of giving it the very disease (81). With tuberculins of the first type, this danger does not exist.

Many physicians are of the opinion that the final specific will be found in the field in which Piorkowski has been working.

The problem is to find a specific that will not only cure tuberculosis but will render the non-infected body immune without any deleterious effects. In the last analysis, at this time, the cure and prevention of this disease is only possible when the following are properly provided: NUTRITION, LIGHT, AIR, REST and RECREATION.

Suggestions

Thus it is seen that the fundamental problem is that of *POVERTY*. For unless it is made possible for every one to have the elements previously mentioned, there is little hope of escape or recovery from the disease. The writer is not able to offer a solution of the proper distribution of wealth. The social legislation of Germany seems to offer some suggestions.

Among the forces that may be used in a national attack upon disease in our public schools, may be mentioned, *The American Medical Association, The National Association for the Study and Prevention of Tuberculosis, The National Educational Association,* the *Census Bureau* and the *Bureau of Education.*

A concerted effort on the part of the *Medical Association* in standardizing the various tests and interpretations of symptoms, in carefully recording their cases and observations, in presenting the important facts to the public, in emphasizing the need of attacking and preventing many diseases in childhood, in demanding that medical colleges give such courses in sanitation, hygiene and children's diseases as will prepare competent medical inspectors, would be of inestimable value.

The National Association for the Study and Prevention of Tuberculosis is doing excellent work. But it is not paying enough attention to the disease at the most important period, namely, childhood. It should foster investigations in this period.

In the Department of Child Hygiene, the *National Educational Association* has an opportunity of making inquiries into such problems as that of tuberculosis among school children. It would do well to include some study of the hygiene of the teacher. This department should be one of its strongest, and part of its funds would be well spent in researches along this line.

In the taking of the census, with the usual information data as to the prevalence of diseases in the family, sanitary conditions and general health status could be obtained.

The *Bureau of Education,* since it receives reports from the whole country, should attempt to gather data regarding the condition of health in the public schools and educational institutions. For a beginning, the regular blanks sent out for superintendents, principals and heads of institutions to fill out, could be modified so as to include questions regarding the sanitary conditions of the institutions and the health of the students so far as present medical inspection allows. These reports would then be accessible to every one. This Bureau

is the best agency for correlating the forces discussed. There should be mutual co-operation and co-ordination of all.

More immediate results may be expected from state-wide efforts in solving this problem. Boards of Health, including State, County, Township and City Boards, should be thoroughly organized and the work so distributed as to prevent needless duplication. A system of records, classification and plan of operation should be agreed upon. There should be the closest possible co-operation with the medical inspectors. As there is very little if any inspection of *rural* schools, it would be wise to have the members of the Township Board of Health inspect the rural and village schools of their township. For this service adequate pay should be given.

The *State Census Bureau* can perform for the state, a function similar to that outlined for the Federal Bureau and as its data are gathered in alternate periods, increase the quantity and continuity of the same.

The *State Boards of Education* should demand of all institutions preparing teachers, that they give and require of prospective teachers, special courses in physiology paying special attention to hygiene, sanitation, the general symptoms of infectious diseases and ill-health. They should require physiological instruction in the grades, consisting largely of topics on sanitation, hygiene and conditions necessary to health.

As the County Superintendent deals for the most part with the rural schools and by virtue of his visits to them knows their condition best, and also as the rural teachers, being responsible to him, can furnish him reports required, he should collect data bearing on the health conditions there.

Through the reports furnished him by the principals, superintendents and heads of educational institutions throughout the state, the State Superintendent, by use of proper blanks should be able to get at the condition of the state as a whole. He and the County Superintendents have the best opportunity for calling attention to the needs of and conditions of the *rural schools.*

Every city should have thorough inspection of its school-plant, teachers, employees, and pupils by physicians employed throughout the year, by the Board of Education. This inspection should begin at the opening of the school year and continue to its end. The inspectors should file reports of their inspections with the principals, superintendent of schools and the City Board of Health, which should co-operate with them in any way possible. In one city they do this through their nurses and their knowledge of parents and home conditions of the children. The teacher's training should be such that

she is able to detect signs of ill-health in her pupils and by reporting these to the medical inspector, expedite his work. The teacher and inspector should confer with the parents, giving such advice as is necessary. And the general public should receive information as to health, not merely concerning diseases, as tuberculosis, but concerning municipal and home hygiene and sanitation. This can be given in lectures, talks, informal meetings of school patrons, leaflets, moving pictures and many other ways. Every one should have at least a knowledge of the effects of the following upon tuberculosis: Occupations, Food (kind and preparation), Bathing, Alcohol, Washing, Breathing (what and how to breathe), Sleeping, Kissing and Spitting. It should be emphasized that the last is probably the greatest factor in infection and for this reason, the individual should take care of the sputum in such a manner as to destroy it by fire or acids.

Children suffering with acute tuberculosis should be excluded from school and institutions such as sanatoria, forest schools and open-air schools should be provided for them (38). They should be separated from healthy children at home, especially in their beds.

Children with closed tuberculosis should receive special attention and continual watching on the part of the inspector and the teacher. To those about to leave school, appropriate advice in the choice of employment should be given.

Healthy children should be removed from tuberculous environment if possible and by all means during the convalescence from such diseases as measles, diphtheria, and scarlet fever. They should not be allowed to play on the floor of the house of tuberculous residents. Persons having acute tuberculosis should not work with or superintend healthy children.

This instruction of the public need not mean a scarehead campaign. It should mean just the opposite;—for a real insight into the operation of the bacilli will remove morbid fear and stimulate healthy care.

Conclusions

From this investigation and study the following conclusions are drawn:

1. Tuberculosis is *PREEMINENTLY* a disease of *CHILDHOOD,* as much so as measles, and hence like the latter should be avoided but when met should be conquered at this period.

2. More data with standardization of the conditions under which they are obtained and recorded are needed.

3. There should be publicity of the facts of tuberculosis, the status of the disease, conditions of recovery, prevention, sanitation and hygiene.

4. Teachers, from the kindergarten through the university, should be required to have and use a knowledge of the conditions of good health and symptoms of ill health.

5. For this knowledge, there should be (a) proper courses in our educational institutions, in hygiene and sanitation and (b) non-certification of teachers until they have this knowledge.

6. Greater care should be exercised in the construction of school buildings. It should be possible for practically two sides at least of a room to be almost entirely open to the air. Furthermore they should be left open, and windows too, as much as possible.

7. Better and more medical inspection of pupils and teachers is needed. The inspectors now working are doing the best they can under the conditions existing. They need help.

8. In view of the vast amount of neglect meted out to the rural pupil and teacher, more investigations of rural conditions and more medical inspection should be provided for them.

9. There is great need of proper intervals of rest, recreation and work for the pupils and teachers. Change of work may give a sense of relief and make one think himself rested but *fatigue* may remain and probably will increase. *Play* is a vital factor in health. Therefore the writer agrees with a German author who insists that "we establish plays and games, in the public schools, the teachers' institutions and the universities."

10. *OPEN-AIR SCHOOLS* are good for all kinds of children, sick and well. While the special needs of the tuberculous child demand such institutions, the normal child should be given the open air as much as possible (7). The greater freedom of the open-air school may be a factor of great significance. It seems to indicate that greater spontaneity is productive of better results, mentally and physically.

11. Proper exercise, with habituation to regular cold-water baths, is an excellent prophylactic (7).

12. General exclusion of tuberculous children, teachers or school employees is unnecessary. Those with open tuberculosis should be excluded and taken care of in separate institutions. The teacher is more dangerous as a source of infection than the pupils. Those openly tuberculous should not have charge of healthy children but should be provided for by the state.

Bibliography

This bibliography contains the titles of books, articles, reports and works referred to in this thesis. In addition, leading periodicals, reports and texts of Medicine and associated sciences have been consulted. The number at the left in the references throughout the text corresponds to the same in this bibliography.

1. Achard, H. J., M. D. Friedmann's New Tuberculin Remedy. New York Medical Journal, Vol. XCVII, No. 8, February 15, 1913. See also Vol. XCVIII, No. 11, September 13, 1913.
2. Ascher, Louis. Zur Statistic der Kindertuberkulose. Zeitschrift für Kinderheilkunde, Vierter Band, Erstes und Zweites Heft, December, 1912.
3. Badaloni, G., Prof., Dr. How the Schools Contribute to the Diffusion of Tuberculosis. International Archives für Schulhygiene, Vol. VIII, Nr. 2/3, August, 1912, pp. 314-315.
4. Baginsky, Dr. Adolph. Organization einer systematischen Bekämpfung der Tuberkulose im Kindesalter. Zeitschrift für Schulgesundheitspflege, XXXIII. Jahrgang, Nr. 8, 1910, p. 550.
5. Baker, S. Josephine, Dr. The Division of Child Hygiene No. 4, Monograph Series, September, 1912. Department of Health, New York City.

5a. Transactions of the Eighth Annual Meeting of the National Society for the Study and Prevention of Tuberculosis, 1912. Published by Wm. F. Fell Company, Philadelphia. Valuable book of 570 pp. Following articles are found in it:

6. Baldwin, Dr. Edward R. The Diagnostic Use of Tuberculin, p. 345.
7. Baruch, Dr. Simon. The External Use of Water for the Enhancing of Resistance to Tuberculosis. pp. 308-322.
13. Brown, Dr. Lawrason. The Present Status of the Therapeutic Use of Tuberculin.
24. Dunn, Dr. W. L. The Use of the Tuberculin Test.
29. Fisher, Irving. A Revised Estimate of the Economic Cost of Tuberculosis.
37. Hutchinson, Dr. Woods. Discussion on pages 170-171.
40. Jenkins, Jr., James. Discussion on page 174.
56. Ludlow, J. L. The Relation of the Layman to the Anti-Tuberculosis Campaign. pp. 60-68.

8. Billings, Dr. F., and Salisbury, J. H., Dr. General Medicine, Practical Medicine Series. Vol. 1, pp. 11-90, 1912. Year Book Publishers. Chicago.
9. —— ——. Vol. 1, pp. 1-115. Year Book Publishers. Chicago, 1913.
10. Billings, John S., Jr., Dr. The Tuberculous Clinics and Day Camps, No. 2. Monograph Series, July, 1912, Department of Health, New York City.
11. Briggs, Dr. Herman. Combating Tuberculosis, Care of Consumptives. Int. Congress of Hygiene and Demography. 1908, Vol. II, pp. 1061-1069. Verlag von August Hirschwald. Berlin, 1908.
12. Brown, Dr. Lawrason. Therapeutic Use of Tuberculin. American Journal of the Medical Sciences. Vol. CXLIV, No. 4, October, 1912. pp. 534-535.
13. See 5a.

14. Bulletin of the North Carolina State Board of Health. Vol. XXVII, No. 10, January, 1913. 22 pages. Edwards & Broughton Printing Company, Raleigh, N. C.
15. CABOT, ARTHUR TRACY. Tuberculosis and the Schools. Atlantic Monthly. November, 1912.
16. CARRINGTON, Dr. T. S. Directions for Living and Sleeping in the Open Air. 24 pages. Pub. Natl. Soc. for S. & P. of Tuberculosis. New York.
17. CHAPIN, Dr. CHARLES V. Sources and Modes of Infection. John Wiley & Sons. New York, 1910. 367 pages.
18. CRAIG, Dr. FRANK A. A Study of the Deaths from Tuberculosis in the Fifth Ward (Philadelphia) during a Period of Forty-Seven Years. American Journal of Public Health. Vol. III, No. 1. 1913. pp. 24-33.
19. CRONQUIST, Dr. JOHAN VON. Erfahrungen über die Behandlung der Kindertuberkulose mit dem Köschen Alttuberkulin. Jahrbuch für Kinderheilkunde. Ser. 3, No. 25. 1912. pp. 556-580.
20. CURTIS, E. W. Out-door Schools. Ped. Sem. Vol. XVI, June, 1909. pp. 169-194.
21. DASKE, Dr. O. Die Tuberkulose in den Volksschulen Düsseldorf. Zeit. f. Schulgesundheitspflege, XXIII. Jahrgang, Nr. 3. 1910. pp. 197-198.
22. DAWSON, W. HARBUTT. Social Insurance in Germany. Pub. by T. Fisher Unwin. London, 1912. 283 pp.
23. D'ESPINE, AD. Tuberculosis and the School. Int. Arch. für Schulhygiene. Vol. VIII. Nr. 2/3, August, 1912. pp. 324.
24. See under 5a.
25. FAIRFIELD, Dr. LETITIA D. A Note on Infectious Disease, Tuberculosis and Education. School Hygiene. London. Vol. III, No. 2, May, 1912. pp. 106-108.
26. FARRAND, Dr. LIVINGSTON. Our Duty to the Tuberculous Child. Proceedings of the Child Conference for Research and Welfare, 2, 1910, pp. 181-186. G. E. Stechert & Co., New York.
27. FEHR, Professor. Versammlung der Tuberkulose-Artze Deutchlands. Zeit. f. Sch. g. h. pflege, XXIII Jahrgang, Nr. 10, 1910. pp. 728-729.
28. FISCHER, ALFRED. The Structure and Function of Bacteria. Ch. XV, XVI, and XVII. Clarendon Press. 1900. Oxford. 198 pages.
29. See under 5a.
30. FRAZER, Dr. JOHN. The Relative Prevalence of Human and Bovine Types of Tubercle Bacilli in Bone and Joint Tuberculosis Occurring in Children. Journal of Experimental Medicine. Vol. XVI, No. 4, October 1, 1912. pp. 432-441.
31. GIBSON, Dr. ALEXANDER. Practice of Medicine. Vol. 1, p. 59. Lippincott Co., Philadelphia.
32. GROTJAHN, A., and KAUP, J. Handwörterbuch der socialen Hygiene. 2. Band, pp. 616-656. F. C Vogel. Leipsic, 1912.
33. HAMBURGER, Dr. FRANZ. Tuberculosis and Childhood. School Hygiene. London. Vol. III, No. 2, May, 1912. pp. 121.
34. HILLENBERG, Dr. Die Verwendbarkeit der v. Pirquet-Reaktion, zur Bekämpfung der Tuberkulose in der Schule. Zt. f. Schulgesundheitspflege, XXIII, Jahrgang, Nr. 9, 1910. pp. 605-620.
35. ——— ———. Zur Entstehung und Verbreitung der Tuberkulose. Zeits. f. Schulges., XXIII, Nr. 4, 1910. pp. 277-278.

36. Heredity and Disease, Proceedings of the Royal Society of Medicine. Vol. II, No. 3, January, 1909. Longmans, Green & Co., New York.
37. See under 5a.
38. JACOBS, Prof. Dr. PAUL. The Preventative and Remedial Factors in the Anti-Tuberculosis Campaign. Int. Arch. f. Schulhyg. Vol. VIII, Nr. 2/3, August, 1912. pp. 318-319.
39. —— ——. Die Bekämpfung der Tuberkulose in den ländlichen Kreisen-des Reg-Bez Osnabruck. Zeits f. Schulges., XXIV, Jahrgang, Nr. 10, 1911. pp. 776.
40. See under 5a.
41. JONES, Dr. LYMAN A. Prevalence of Tuberculosis among Children Employed in Factories in Berkshire County. Monthly Bulletin of the State Board of Health of Massachusetts. Vol. 6, No. 2, 1911. Boston.
42. JORDAN, H. E. The Need for Genetic Study of Tuberculosis. The Journal of the American Medical Association. Vol. LIX, No. 17, October 26, 1912. pp. 1518-1519.
43. KELYNACK, T. N. Children and the Anti-Tuberculosis Movement. XIVth Int. Congress of Hygiene and Demography. Vol. 4, pp. 253-255. Verlag von Hirschwald. Berlin, 1908.
44. KERR, Dr. JAMES. Elementary Schools and Tuberculosis. School Hygiene. London. Vol. I, 1910. pp. 14-20.
45. KIRCHNER, Prof. Dr. MARTIN. Bekämpfung der Tuberkulose, Fürsorge für Phthisiker. XIVth Int. Congress of Hygiene and Demography, 1908. Vol. 2. pp. 1027-1053.
46. KLEBS, Dr. ARNOLD C. Tuberculosis. Appletons, New York, 1909. 939 pages (text).
47. KOCH, Dr. FRANZ. Über die Genese und Prophylaxe der mechanischen Disposition der Lungenspitzen zur Erkrankung an tuberkuloser, Phthisis. Arch. für Rassen und Gesellschafts Biologie, 1910. Vol. 7. pp. 775-776.
48. KOCH, Dr. ROBERT. Epidemiology of Tuberculosis. Annual Report of Smithsonian Institution, 1910. Washington, 1911. pp. 659-674.
49. Frequency of Tuberculous Infection in Children. Lancet, Vol. 1, April 13, 1912. p. 1007.
50. LANDOUZY, L., and LAEDERICH, L. In Preventative Medicine. Practical Medicine Series. Vol. VIII, 1912. pp. 231-233.
51. LAPAGE, C. P. Cutaneous Reaction to Tuberculin in Childhood. British Journal of Children's Diseases. November, 1912, IX, No. 107. pp. 481-528.
52. LEE, JOSEPH. Open Air Rooms in the Boston Schools. Proceedings of the Child Conference for Research and Welfare, II, 1910. pp. 187-191. G. E. Stechert & Co., New York.
53. LORENZ, Dr. FRIEDRICH. Die Mitwirkung der Schule in Kämpfe gegen die Tuberkulose. Zeits. f. Schulges., 23. Jahrgang, No. 8, 1910. pp. 554-555.
54. —— ——. Die Schulpraktische Arbeit an der Tuberkulosebekämpfung. Zeits. f. Schulges., 23. Jahrgang, No. 4, 1910. pp. 255-263.
55. LUCAS, R. CLEMENT. Bradshaw Lecture, December, 1911. Adlord & Son. London, 1912.
56. See under 5a.
57. MICHAEL, Dr. MAY. Resumé of Work on Tuberculosis in Children for 1912. American Journal of Diseases of Children. Vol. 5, No. 2, February, 1913. Am. Medical Assn. Chicago.

58. Moltschanoff, Dr. W. J. Beobachtungen über v. Pirquets Tuberkulin reaktion bei akuten Infektionskrankheiten beim Kindern. Jahrbuch für Kindheilkunde. Ser. 3, XXV, 1912. pp. 435-451.
59. Moore, Ernest C. How New York City Administers Its Schools. pp. 112. World Book Company. New York, 1913.
60. Nietner, Prof. Dr. Die Bekämpfung der Tuberkulose unter Schulkindern. Int. Arch. f. Schulhyg. Vol. VIII, Nr. 4, No. vember, 1912. pp. 461-476.
61. —— ——. Die Tuberkulose in Kindesalter und ihre Bekämpfung in Hause und Schule. Zeits. f. Schulges., 1910, XXIII, Jahrgang, No. 10. p. 741.
62. —— ——, and Lorenz, Dr. F. Das Wesen der Tuberkulose als Volkskrankheit und ihre Bekämpfung durch die Schule. Zeits. f. Schulges. 1910, 23 Jahrgang, Nr. 1, 62-64.
63. Orth, Dr. J. Importance of Bovine Bacilli for Human Beings. Extract from Berliner klinische Wochenschr., March 10, L., No. 10, in The Journal of the Am. Medical Assn., April, 1913. Vol. LX, No. 16. pp. 1267.
64. Osler, Dr. Wm., and McCrea, Dr. T. A System of Medicine. Vol. I, page 22. Oxford Med. Publications, 1907.
65. Otis, Dr. Edward O. Institution for the Prevention and Cure of Tuberculosis. Int. Arch. für Schulhyg. Vol. VIII, Nr. 2/3, August, 1912. pp. 319.
66. Pearson, Karl. The Fight Against Tuberculosis and the Death Rate from Phthisis. Dulau and Co., Ltd. London, 1911. 35 pages.
67. —— ——, and Others. Draper Company Research Memoirs. II, A First Study of the Statistics of Pulmonary Tuberculosis. 1907. III, A Second Study—Marital Infection. 1908. VI, A Third Study—Mortality of Tuberculose and Sanatorium Treatment. 1910. VIII, A Fourth Study. 1913. Dulau & Co., Ltd. London.
68. —— ——. Tuberculosis, Heredity and Environment. Dulau & Co., Ltd. London. 46 pages. 1912.
69. Pirquet, Clemens von. Frequency of Tuberculosis in Childhood. Jr. of Am. Med. Assn., No. 9, Vol. LII, February 27, 1909. pp. 675-678.
70. Pottenger, Dr. Francis Marion. The Relationship Between the Infection in the Child and the Clinical Tuberculosis in the Adult. Am. Journal of Diseases of Children. Vol. 4, No. 1, July, 1912.
71. Public School Messenger. Vol. X, No. 3, January, 1912. Official Publication of the Department of Instruction. St. Louis, Mo.
72. Ravenal, Dr. Mazyck P. Infection through Food and Contact. XIVth Int. Cong. Hygiene and Demography. Vol. 2, 1908. pp. 29-41. Hirschwald. Berlin, 1908.
73. The Registration and Sanitary Supervision of Pulmonary Tuberculosis in New York City. No. 1, Monograph Series, February, 1912. Department of Health, New York City.
74. Reports of the Tuberculosis Commissions of Health, 1902-04, and 1906 State Board of Health. Baltimore, Md.
75. Report of Committee of Boston Assn. for Relief and Control of Tuberculosis. Geo. S. C. Badger, Chairman, November, 1912.
76. Annual Report of the Pasadena City Schools. Pasadena, June 30, 1912.

77. Ricker, Dr. A. J. The Rôle Played by Resistance in Pulmonary Tuberculosis. Medical Record. Vol. 82, No. 17, October 26, 1912. pp. 783.
78. Ringer, Paul H. Further Study of the Prognostic Value of Arneths Leukocytic Blood Pictures in the Diagnosis of Pulmonary Tuberculosis. Am. Jr. of the Medical Sciences. Vol. CXLIV, No. 4, October, 1912.
79. Rosenbach, Dr., Prof. O. Physician versus Bacteriologist. Chap. XIII, XVIII, XXVI. Funk and Wagnalls, 1904.
80. Ruck, Dr. Karl von. A Practical Method of Prophylactic Immunization against Tuberculosis. Medical Record. Vol. 82, No. 9, August 31, 1913.
81. —— ——. The Relative Value of Living and Dead Tubercle Bacilli and of their Endotoxins in Solution in Active Immunization against Tuberculosis. Med. Record. Vol. 83, No. 12, March 22, 1913.
82. Ruttman, W. F. Schulhygiene für Pädägogen. Bayreuth, 1912.
83. Schloszman, Dr., Prof. A., and Monti and Hamburger. Die Tuberkulosehaufigheit im Kindesalter. Arch. für Rassen-und Gesellschafts-Biologie, 1909. Vol. 6. pp. 407.
84. Schmidt, Dr. Die Tuberkulose bei Volksschullehrern. Zeits. für Schulges., 1910, XXIII, Jahrgang, No. 4. pp. 278-279.
85. Shafer, George H. Health Inspection of Schools in the United States. Ped. Sem. Vol. XVIII, No. 3, September, 1911. pp. 273-314.
86. Shaw, Dr. Henry, and Laird, Dr. A. The Diagnosis of Tuberculosis in Young Children. Archives of Pediatrics. Vol. 29, July, 1909. pp. 481-489.
87. Squire, J. E. The Incidence of Tuberculosis in Children with Special Reference to School Attendance. Lancet. Vol. II, August 6, 1910. pp. 373-375.
88. Steenhoff, Dr. G. The State of Health in the Infant and Elementary School Teachers of Sweden. Arch. f. Schulhyg. Vol. 7, 1911. p. 565.
89. Steinhaeuser, R. J. The Control of Tuberculosis as Practiced in the County Town of Lewes. Journal of the Royal Sanitary Institute. Vol. XXXIII, No. 11, December, 1912. pp. 535-537.
90. Steinhaus, Dr. F. Beobachtung über die Tuberculosehäufigkeit an Dortmunder Volksschulkindern im Schuljahre, 1906-7. Zeits. f. Schulges., XXIII, Jahrgang, Nr. 4, 1910. pp. 275-277.
91. Stephani, Dr. Die Mitwirkung der Schularzte bei der Tuberkulosebekämpfung. Zeits. f. Schulges., XXIII, Jahrgang, Nr. 4, 1910. p. 241.
92. —— ——. Über die Haufigkeit der Tuberkulose bei Schulkinder. Zeits. f. Schulges., XXIV, Jahrgang, Nr. 7, 1911. pp. 541-542.
93. Stenberg, Dr. G. M. Infection and Immunity, page 26 (text). John Murry. London, 1913.
94. —— ——. A Manual of Bacteriology. Ch. XI, pp. 374-392. William Wood & Company, New York.
95. Strumpell, Dr. Adolph v. Textbook of Medicine. Vol. I, page 279. 4th American Edition. D. Appleton & Company, New York.
96. Terman, Lewis M., Ph.D. The Teacher's Health. Ch. III. Houghton Mifflin Company, 1913. 132 pages.
97. Tuberculosis in School Children. School Hygiene. London. Vol. II, No. 6, June, 1911. p. 348.

98. Two Years' Work by the St. Louis Society for the Relief and Prevention of Tuberculosis, 1910-11. Board of Education Building, St. Louis, Mo.
99. WACHENHEIM, Dr. F. L. The Diagnostic Value of the Cutaneous Tuberculin Test of von Pirquet. Am. Jr. of Children's Diseases. Vol. 4, No. 1, July, 1912, page 26.
100. —— ——. Notes on Tuberculosis in School Children. Proceedings of the Child Conference for Research and Welfare, I, 1909. G. E. Stechert & Co., New York. pp. 65-72.
101. WALSH, Dr. S. B. The Treatment of Tuberculosis in School Children. School Hygiene. London. Vol. II, No. 10, October, 1911. pp. 589-592.
102. WEINZIRL, JOHN. The Action of Sunlight upon Bacteria with Special Reference to Bacilli of Tuberculosis. Reprint from Jr. of Infectious Diseases, 1907.
103. WELEMINSKY, FRIEDRICH. The Ways of Entrance and the Diffusion of the Tubercle Bacilli in the Organism. Int. Arch. f. Sch. hg. Vol. VIII, Nr. 2/3, August, 1912, pp. 333.
104. WIMMENHAUER, Dr. PAUL. Über Tuberkulinimpfungen nach von Pirquet bei Schulkindern. Zeits. f. Schulges., 25 Jahrgang, No. 4, 1912, pp. 245-264.
105. —— ——. Über die Beziehungen des Gebiesse zum Ernahrungszustand bei Schulkindern. Zeits. f. Schulges., XXIII, Jahrgang, Nr. 7, 1910, pp. 470-471.
106. ZIBELL, Dr. Die im Preuszen gegen Verbreitung der Tuberkulose in den Jahren 1903 bis 1908, getroffenen Masztnahmen. Zeitschrift für Schulgesundheitspflege, VIII Jahrgang, Nr. 9, 1910, p. 742.

THE DEVELOPMENT OF A CHILD'S VOCABULARY

By William Boyd, M. A., B. Sc., D. Phil., The University of Glasgow

Introduction

The child whose speech has provided the materials for the present study was born in a small village 3 or 4 miles south of Glasgow, Scotland, on May 28th, 1909. Up to the beginning of the fifth year, when the last observations here recorded were made, she had received very little direct education, but every opportunity had been taken to make her acquainted with the more interesting facts of town and country life. In particular, special attention had been paid to her speech. Baby words and idioms were avoided from the first and care was taken to speak to her in language as concrete and specific as possible. For her part, she responded readily to this indirect training in good speech. By the end of the third year, she had acquired the habit of picking out unfamiliar words, asking their meaning, and thereafter using them frequently until she had mastered them; and by the end of the fourth year, there was evident a nascent feeling for words, showing itself occasionally in a desire for right rhythm and correct usage.

The first words used by her with unmistakable reference to the facts of experience were "dog" and "dada," which were uttered frequently by her in the first week of the 11th month. Explicit predication through the conjunction of a noun and a verb or adjective began in the first fortnight of the 17th month with a few phrases like "bell ring," "leaves fall" and one three word sentence "Isa do it." The vocabulary recorded during the fortnight consisted of 109 nouns, 30 verbs, 1 pronoun, 8 adjectives, and 8 adverbs (see below). Comparison with corresponding lists in Tracy (*Psychology of Childhood,* p. 140 seq.) suggests a certain precocity in the capacity for verbal expression, and this is still more marked in the character and extent of the vocabulary in use at the end of the second year. But apart from a quickness of mind of which this is the most obvious indication, the child is not and has not been generally precocious. In some respects (for example, in the naming of colors, in number, in tune) she is rather behind what seems to be the average of intelligent children than ahead.

By the 20th month, her speech though still very imperfect and characterised by many peculiarities of idiom showed a distinct approximation to normal speech. With a view to studying the sentence structure at this stage,[1] I made a collection of her utterances during the last week of this month, noting down all the sentences I could, and only rejecting a few which were meaningless or mere echoes of what other people said. I did this again in the last week of each month up to the end of the 2nd year, and accumulated altogether 1,240 sentences. Before the end of the third year came, it had occurred to me that I had in these sentences valuable material for the study of the child's working vocabulary, and to follow out the development of speech forms I gathered 1,250 sentences in the same manner in the last fortnight of the 36th month. Then two months later, after I had had time to work through these, I made the vocabulary contained in these sentences the starting point for the compilation of the child's complete vocabulary. At the end of the fourth year I repeated what I had done the year before: collected 1,250 sentences in the last fortnight of the 48th month, and recorded the complete vocabulary two months after. On the two occasions, it should be added, care was taken to make the collection of sentences over as wide a field of experiences as possible, and yet to reproduce certain typical situations. Both years, sentences were got at all times of the day, at home, in the garden, on a country walk, during a train journey, on a visit to town. The sentences at the end of the second year were collected under rather different conditions. Besides being spread over a longer period, they were mainly got in and around the home. The life of a two-year-old child is necessarily more restricted than that of the three- or four-year-old, and the difference is reflected in the vocabulary.

The Vocabulary at 17 Months

Before proceeding to an examination and analysis of the vocabularies at 2, 3, and 4, I give the vocabulary at 17 months, arranged in word groups similar to those employed for the later ages. In the nature of the case it is rather difficult to fit distinctions either of form or content, which are proper to developed speech, to rudimentary sentences of one or two words. Words like "Down" or "Away" (meaning "Put it down" and "He has gone away") are not strictly adverbs in this usage, though containing the adverbial idea. The adjective in some cases, perhaps in all, is not really an adjec-

[1] I have discussed this in an article on "The Beginnings of Syntactial Speech," in *Child Study* (London), March and April, 1913.

tive, but an inseparable part of a substantive; and a word like "Burn" uttered with emotional emphasis at the sight of a teapot, which one classifies as a verb, is really as much an adjective as a verb. But partly because most of the words in common use at this stage are exceedingly simple in connotation, partly because even the most complex in implication develop into sentence elements comparatively soon, it is permissible to employ the ordinary categories for them for purposes of comparison with later speech.

NOUNS (109)—

1. *Body:* cheek, ear, foot, hand, leg, nail, neck, nose, teeth, toe.
2. *Food:* biscuit, bread-and-butter, drink, egg, fish, granose, jam, milk, porridge, potatoes, strawberry, sugar, sweetie, tea.
3. *Dress:* blanket, bonnet, boot, clothes, dress, feeder, gown, hat, hood, jersey, napkin, pin, petticoat, sash, shoes, socks, stockings.
4. *Household, etc.:* (a) bag, bath, bell, bottle, box, brush, chair, clock, coal, comb, gas, matches, powder, ring, soap, sponge, spoon, water. (b) penny, purse, ticket, watch.
5. *Topography:* sea.
6. *Locomotion:* car, pram, train.
7. *Animals:* bear, bird, cat, cow, dog, horse, sheep. 3 particular dogs.
8. *Plants:* daisy, flower, grass, leaf.
9. *Play:* (a) dolly, pail, shell, spade, stick. (b) book, letter, paper, pencil, (postal) card.
10. *Time:* noon.
11. *People, etc.:* aunt, baby, boy, daddy, darling, girl, grandpa, lady, mamma, man, post(man). 2 adults and 3 children.

PRONOUN (1)—it.

ADJECTIVES (8)—bad, dear, dirty, fat, good, more, poor, sweet (caught, done).

VERBS (30)—bring, burn, carry, catch, clap, come, cut, do, dry, fall, get, go, kick, kiss, knit, look, meet, open, pull, push, ring, shut, sit, sleep, speak, sweep, tickle, wag, warm, wash.

ADVERBS, ETC. (8)—away, down, now, up. No, yes. Thank you, good-by.

Among the nouns (which constitute 70% of the list), it will be noted that words denoting the objects of the child's

immediate environment—parts of the body, articles of food and clothing, household articles of personal utility—figure largely. So also do the names of animals, and still more of people. But more remote facts are scantily represented: there are few words relating to the house, the neighborhood or locomotion. There is however, rather unexpectedly, a time word ("noon") and a quantitative expression ("more"). Verbs denoting for the most part actions that concern the child make up 19% of the list, a proportion not far short of that normal from 2 to 4. The adjectives and adverbs, as has already been indicated, are somewhat exceptional in character. The process of detaching attributes from nouns, and modes from verbs, is still rudimentary; and adjectives are as yet bound up with nouns or are used for them, and adverbs generally function as verbs. It is worthy of note that the moral epithets "good" and "bad" appear on the meagre list of adjectives, and that there are no less than 3 adverbs of place.

The Working Vocabulary from Two to Four

A mere list of the words known and used by a child at any particular age has only a limited value as an index of mental content. On such a list, words common and uncommon, fundamental and accidental, stand together without distinction; and the proportions of the different elements of a sentence (say of nouns and verbs, or verbs and adverbs) are completely different from what they are in actual speech. To get a more intimate knowledge of the actual words used by the child, we must employ the statistical method of samples and examine the words found in a sufficiently large number of typical sentences. Following this course, I have taken the sentences collected at 2, 3 and 4, and sought by proper arrangement and classification to bring out their significance as an expression of the mental development of the child. This method, it need scarcely be said, does not give the whole vocabulary but it gives a considerable proportion of it. At 3, the words included in the collected sentences make up 58% of the total vocabulary. At 4, they make up 40%. Moreover, for any lack of completeness, there is ample compensation in the representative character of the words under examination. Even allowing for accidental variations owing to unavoidable differences in the conditions under which the collections were made, the chances are that any particular group of words though not appearing in full strength will appear in more or less proportionate strength, and the larger the groups the more exact will the proportion be. And if we count the total words used instead of reckoning each word only once, as we

must do if we content ourselves with a list made in dictionary fashion, we may hope to get a still more precise measure of the varying importance of the different interests represented by the words.

The best justification of the method is its results. I proceed, therefore, to give the lists of words in use at the three ages under consideration, arranged in groups, with a statement of the whole number of the words used in each group.[2] Thereafter, I shall try to indicate the more important implications in some detail.

NOUNS

Vocabulary: II, 323, III, 418, IV, 435.
Total Words: II, 1,528, III, 1,283, IV, 1,289.

1. *Body:*

II: V. = 19; T. W. = 69.
Arm, bosom, brow, cheek, chin, eye, face, feet, finger, hair, hand, knee, leg, mouth, nose, skin, tear, thumb, toe.

III: V. = 30; T. W. = 104.
Arm, back, body, cheek, chin, curl, ear, elbow, eye, face, finger, foot, hair, hand, head, heart, knee, lap, leg, mouth, nose, shoulder, skin, stomach, sweat, tail, tipheels, throat, toe, tongue.

IV: V. = 33; T. W. = 105.
Arm, back, blood, bottom, breast, brow, cheek, chin, crown, curl, elbow, eye, face, finger, foot, hair, hand, heel, knee, leg, lip, mark, mouth, nail, neck, nipples, nose, skin, stomach, tail, throat, toe, tooth.

1a. *Health:*

II: V. = 2; T. W. = 2.
Sanatogen, Magnesia.

III: V. = 6; T. W. = 8.
Burn, chill, measles, rickets, Cod liver oil, Formamint.

IV: V. = 7; T. W. = 13.
Cold, hiccough, operation, Castor oil, Formamint, Health salts, Rebeleine.

2. *Food:*

II: V. = 33; T. W. = 153.
Biscuit, bread, bun, butter, bone, cake, cakeoma, chocolate, corn flour, cream, crumbs, drink, egg,

[2] NOTE: Throughout the lists, V. denotes the actual vocabulary in which each word is counted only once: T. W., the Total Words, every word being counted as often as it is used. Roman numerals, II., III., and IV., indicate age.

fish, flour, grape nuts, jelly, juice, lemonade, milk, porridge, potato, prune, pudding, salt, saps, scone, sponge-cake, sugar, sweetie. Breakfast, dinner, supper.

III: V. = 32; T. W. = 76.

Allenbury's, Benger's, biscuit, bite, bone, bread, bread crumbs, cake, chocolate, chop, cocoa, crumbs, custard, egg, food, gravy, lime juice, meat, milk, mustard, pie, plum, porridge, potato, salt, scone, scoot, semelina, soup, sugar, tea, water. Dinner.

IV: V. = 28; T. W. = 77.

Banana, bread, bun, butter, cake, cream, curds, drink, egg, food, gravy, gristle, juice, lemon, lemonade, meat, milk, mince, potato, scrapings, sip, soda-water, soup, tea, water. Breakfast, dinner, grace.

3. *Dress:*

II: V. = 31; T. W. = 79.

Apron, binder, boot, button, clothes, coat, combinations, dress, feeder, gloves, gown, handkerchief, hat, knickers, muff, muffler, napkin, petticoat, pinafore, rabbit bonnet, ribbon, safety-pin, sash, semmit, shoe, skirt, slipper, stocking, tie, waterproof. Flannel.

III: V. = 34; T. W. = 75.

Apron, band, blanket, blouse, boot, bow, brooch, button, clothes, coat, comb, combinations, dress, frock, glove, golosh, hairpin, hanky, hat, hook, nightgown, petticoat, pocket, safety-pin, shoe, sleeve, slipper, skirt, sock, stocking, suspender, underskirt. Linen, wool.

IV: V. = 34; T. W. = 86.

Binder, bonnet, boot, bow, clasp, clothes, coat, dress, dressing-gown, eye, garter, glove, hanky, hat, hole, hook, knickers, I, napkin, petticoat, pocket, ribbon, sash, shawl, shield, shoe, sleeve, stocking, suspender, tie. Lace, silk, stitch, thread.

4a. *Personal Belongings:*

II: V. = 8; T. W. = 17.

Cigarette, fountain pen, money, pipe, purse, ring, specs, watch.

III: V. = 4; T. W. = 5.

Money, penny, purse, thimble.

IV: V. = 9; T. W. = 18.

Case, cigarette, glasses, photograph, pipe, scent, teat, umbrella, watch.

4b. *Domestic Articles:*

II: V. = 50; T. W. = 187.

Bag, bath, bed, bedcover, bell, blanket, box, brush, chair, clock, couch, cover, cradle, cup, drawer, egg-spoon, fire, fork, gas, glass, gum, hob, inchtape, iron, jug, lid, machine, mat, milkcan, paint, pan, parcel, Pears' soap, piano, pillow, plate, plug, saucer, shaving soap, sheet, soap, spade, sponge, spoon, table, table-cover, tea-cosy, tumbler, water, water-can.

III: V. = 45; T. W. = 98.

Bar, basket, bath, bed, bedcover, bottle, bowl, bundle, chair, china, clothes-basket, couch, cup, deck-chair, dirt, dust, duster, fire, fork, glass, gramophone, iron, ironing, lid, mess, mirror, nail, parcel, pillow, pin, plate, pot, red-stone, rope, seat, soap, soot, sponge, spoon, table, table-cover, tongs, tray, tumbler, vase.

IV: V. = 52; T. W. = 126.

Bag, basket, bed, bed-clothes, bell, bottle, bowl, box, brush, cage, chair, clock, coal, cork, cream-jug, cup, deck-chair, dirt, dish, dust, electricity, glass, hammer, jar, knot, lamp, light, mess, mirror, nail, pillow, ring, scissors, screen, screw, seat, siphon, soap, stool, string, table, tin, tumbler, vase, wheel, wire. Click, fork, plate, smoke, soot, spoon.

5. *House:*

II: V. = 15; T. W. = 43.

Blind, drawing-room, floor, garden, garden-wall, handle, house, kitchen, mantelpiece, parlor, room, study, wall, window.

III: V. = 18; T. W. = 48.

Blind, chimney, dining-room, door, garden, house, kitchen, oven, press, rack, rookery, roof, room, stair, steps, stove, wall, window.

IV: V. = 17; T. W. = 58.

Baluster, bedroom, cupboard, door, fire, floor, frame, garden, green, house, kitchen, oven, press, room, shelf, stair, window.

6. *Topography:*

II: V. = 10; T. W. = 16.

Bridge, gate, place, pole, road, sea, village, wood, wave. Stone.

III: V. = 27; T. W. = 59.
Bank, bridge, drain, east, field, hedge, hill, mountain, park, pipe, place, pole, pool, quarry, road, sea, shore, street, town, trough, village, water, wood. Chuckies, mud, sand, stone, tar.
IV: V. = 28; T. W. = 86.
Bank, bonfire, bridge, burn, canal, field, flag, golf course, line, park, paling, place, railway, road, signal, snow drift, station, street, tunnel, underground, village, way, well, wood. Mud, stone, tar.

6a. *Particular Places:*
II: V. = 2; T. W. = 4.
A town, a house.
III: V. = 12; T. W. = 14.
1 house, 2 streets, 7 towns, 2 other places.
IV: V. = 12; T. W. = 19.
2 rivers, 3 streets, 7 towns.

7. *Meteorology:*
II: V. = 7; T. W. = 17.
Cold, draught, rain, shadow, snow, sun, wind.
III: V. = 6; T. W. = 11.
Air, cold, rain, sunshine, weather, wind.
IV: V. = 9; T. W. = 13.
Air, dark, draught, heat, moon, rain, snow, sun, wind.

8. *Locomotion:*
II: V. = 6; T. W. = 32.
Barrow, boat, carriage, engine, train, walk.
III: V. = 10; T. W. = 19.
Boat, cart, motor car, train. Picnic, race, ride, sail, trip, walk.
IV: V. = 9; T. W. = 29.
Barge, bicycle, boat, car, cart, engine, pram, train, walk.

9. *Animals:*
II: V. = 25; T. W. = 70.
Bird, buckie, calf, chicken, cock, cow, dicky-bird, dog, duck, goose, hen, horse, lamb, moose, mouse, parrot, pigeon, pony, puppy, pussy, swan, worm. Claw, fur, paw.
III: V. = 30; T. W. = 79.
Bear, beast, bee, bird, bluebottle fly, cat, chicken, cow, crow, dog, fish, fly, foal, hen, horse, insect, lion, mongoose, moth, mouse, pig, swan, wasp, worm. Beak, droppings, feather, nest, sting, wing.

IV: V. = 25; T. W. = 75.
Animal, beast, bird, cat, chicken, cow, daddy-long-legs, dog, duck, fish, fox, goat, guineapig, hen, horse, lion, pussy, rabbit, robin, sheep, swan, tadpole. Beak, claw, feather.

9a. *Particular Animals:*
II: V. = 8; T. W. = 52.
1 bird, 1 cat, 6 dogs.
III: V. = 7; T. W. = 19.
7 dogs.
IV: V. = 2; T. W. = 2.
2 dogs.

10. *Plants:*
II: V. = 6; T. W. = 17.
Daisy, lily, moss, tree. Flower, leaf.
III: V. = 18; T. W. = 32.
Daisy, dandelion, grass, monkey puzzle, nettle, pansy, plant, poppy, rose, tulip, violet, wallflower. Blossom, bud, bunch, flower, stalk, tree.
IV: V. = 19; T. W. = 43.
Balm, broom, carnation, grass, lily, lily of the valley, polyanthus, 'puff-puff,' rose, tulip, whin. Bud, bunch, leaf, flower, petal, seed, stem, thorn.

11. *Play and Occupations:*
II: V. = 24; T. W. = 93.
Ball, bool, brick, bubble, castle, doll, game, half-circle pillar, toy, shell, splash, toybox. Book, ink-bottle, lead-pencil, lesson, letter, paper, pencil, post-card, prize, rubber, writing.
III: V. = 22; T. W. = 104.
Ball, bead, blindman's buff, bricks, doll, game, golf-ball, jingo-ring, ninepins, pail, pram, skipping-rope, squeal, story, string, swing, tig, wheel. Book, paper, picture, present.
IV: V. = 22; T. W. = 57.
Ball, bead, bubble, crook, doll, exercise, game, mouth-harmonium, singing, song, stick, story, swing. Lesson, page, paper, pencil, picture, poetry, prize, reading, work.

11a. *Particular Dolls:*
II: V. = 4; T. W. = 27.
III: V. = 8; T. W. = 18.
IV: V. = 4; T. W. = 16.

11b. *Personal Experiences:*

II: V. = 10; T. W. = 19.
Dip, kiss, pain, shave, sleep, smell, smoke, rest, talk, whackie.

III: V. = 12; T. W. = 16.
Carry, clap, dream, fright, hush, kiss, knock, pain, rest, sleep, smell, whacking.

IV: V. = 9; T. W. = 17.
Carry, jumping, fright, prick, rest, sleep, smell, taste, trouble.

12a. *Time:*

II: V. = 4; T. W. = 10.
Afternoon, day, minute, time.

III: V. = 11; T. W. = 39.
Afternoon, birthday, day, holiday, minute, morning, night, summer, Sunday, time, year.

IV: V. = 14; T. W. = 69.
Afternoon, birthday, day, half-an-hour, hour, minute, morning, night, Saturday, summer, Sunday, time, while, winter.

12b. *Quantity:*

II: V. = 3; T. W. = 23.
Bit, drop, pair.

III: V. = 7; T. W. = 36.
Bit, drop, hundreds, lot, rest, sprinkle, swarm.

IV: V. = 17; T. W. = 55.
Bit, boxful, cupful, drop, grain, half, half-a-dozen, load, lot, lump, pair, piece, pound, scrap, strip, tinful, tumblerful.

12c. *Position:*

II: V. = 1; T. W. = 1.
Corner.

III: V. = 5; T. W. = 11.
End, front, middle, side, top.

IV: V. = 6; T. W. = 12.
Corner, end, front, middle, side, top.

13. *People:*

II: V. = 24; T. W. = 279.
Aunt, baby, boy, daddy, dancer, daughter, father, girl, gentleman, grandma, grandpa, lady, love, mamma, man, mother, queen, weenie. Coalman, grocer, milkgirl, postman, shepherd, shoplady.

III: V. = 30; T. W. = 278.
Baby, boy, children, crowd, daddy, fondling, friend, girl, grandma, infant, lady, mamma, man, mother, people, sister, sweetheart, 'tiny.' Conductor, doctor, farmer, ironman, milkgirl, painter, plantman, policeman, postman, post office lady, sweep, workman.
IV: V. = 25; T. W. = 184.
Baby, boy, brother, children, daddy, dearie, elf, fairy, father, grandma, grandpa, girl, God, lady, lassie, mother, man, master, patient, people, pet, sister. Doctor, inspector, nurse.

13a. *Particular Persons:*
II: V. = 20; T. W. = 289.
8 adults, 10 children, 2 literary, etc. personalities.
III: V. = 20; T. W. = 58.
10 adults, 4 children, 6 literary, etc. personalities.
IV: V. = 28; T. W. = 60.
14 adults, 7 children, 7 literary, etc. personalities.

13b. *Institutions:*
II: V. = 5; T. W. = 14.
Farm, home, lecture, post, shop.
III: V. = 9; T. W. = 28.
Church, concert, home, hospital, party, school, shop, University, works.
IV: V. = 9; T. W. = 17.
Band, church, nursing home, home, prison, school, Sunday school, tea-party, works.

14. *Ideal Facts:*
II: V. = 6; T. W. = 15.
Fun, name, nonsense, stuff, thing, way.
III: V. = 15; T. W. = 46.
Bother, care, color, harm, hotness, mischief, name, nonsense, pardon, plenty, secret, stuff, thing, treasure, way.
IV: V. = 17; T. W. = 52.
Attention, beauty, calamity, fun, hurry, kind, mistake, name, permission, plan, question, rosiness, shelter, size, stuff, thing, way.

Pronouns

Vocabulary: II, 18; III, 30; IV, 37.
Total Words: II, 257; III, 1,237; IV, 1,577.

1. *Personal:*

II: V. = 7; T. W. = 157.
I, self, me, it, herself, you, us.
III: V. = 17; T. W. = 1,043.
I, me, myself, mine, he, him, she, her, herself, it, we, us, you, yours, they, them, themselves.
IV: V. = 19; T. W. = 1,296.
I, me, myself, mine, he, him, himself, she, her, herself, it, itself, we, us, you, yours, they, them, themselves.

2. *Relative:*

II: V. = 0; T. W. = 0.
III: V. = 2; T. W. = 22.
That, what.
IV: V. = 2; T. W. = 39.
That, what.

3. *Interrogative:*

II: V. = 1; T. W. = 5.
What?
III: V. = 3; T. W. = 38.
What? which? who?
IV: V. = 4; T. W. = 56.
What? which? who? whose?

4. *Demonstrative:*

II: V. = 4; T. W. = 83.
This, that, these, yonder.
III: V. = 3; T. W. = 102.
This, that, these.
IV: V. = 3; T. W. = 131.
This, that, these.

5. *Indefinite, etc.:*

II: V. = 6; T. W. = 12.
Both, one, none, some, something, everything.
III: V. = 6; T. W. = 32.
One, some, anything, anybody, somebody.
IV: V. = 9; T. W. = 55.
One, none, some, any, nobody, anything, anybody, something, somebody.

ADJECTIVES

Vocabulary: II, 89; III, 159; IV, 173.
Total Words: II, 571; III, 1,359; IV, 1,270.

1. *Qualitative:*

II: V. = 69; T. W. = 395.
III: V. = 125; T. W. = 428.
IV: V. = 131; T. W. = 380.

a. *Sense*

II: V. = 14; T. W. = 40.
Black, dark, red, white, yellow. Burning, cold, cool, hot, warm. Sharp, soft, tight. Heavy.
III: V. = 18; T. W. = 40.
Black, blue, pale, red, white. Cold, hot warm. Hard, tickly, tight. Heavy. Humming. Dizzy. Nippy, sour, sweet, thirsty.
IV: V. = 25; T. W. = 55.
Black, black-and-blue, blue, brown, dark, glossy, pink, red, white. Cold, hot, warm. Sharp, blunt, firm, hard, soft, sticky, slack, tight. Heavy. Scented. Dry, sugary, thirsty.

b. *Spatial*

II: V. = 5; T. W. = 169.
Big, little, long, tiny, wee.
III: V. = 15; T. W. = 185.
Big, full, great, last, left, little, long, low, next, short, stout, stumpy, tiny, tremendous, wee.
IV: V. = 26; T. W. = 156.
Back, big, bottom, broad, flat, full, great, high, huge, large, last, little, long, low, low-down, near, next, nigh, past, short, slim, small, tiny, underground, underneath, wee.

c. *Moral and aesthetic*

II: V. = 12; T. W. = 88.
Bad, better, good, kind, naughty, right, silly, sorry. Beautiful, bonny, nice, pretty.
III: V. = 27; T. W. = 90.
Angry, bad, better, careful, careless, generous, gentle, good, horrid, impatient, kind, naughty, polite, proud, right, rude, silly, unsuitable, unkind, worth, wrong. Beautiful, charming, lovely, nice, pretty, ugly.

IV: V. = 20; T. W. = 63.
Bad, better, best, careful, cheeky, frightening, good, kind, naughty, right, rude, worse, wrong. Beautiful, fancy, lovely, nasty, nice, pretty, wonderful.

d. *Human*

II: V. = 16; T. W. = 40.
Busy, clever, cautious, dear, fond, frightened, funny, hungry, late, neat, poor, ready, sore, strong, tired, well.

III: V. = 16; T. W. = 26.
Awful, chubby, dear, fond, funny, healthy, ill, lucky, quiet, poor, rich, sleeping, sore, strong, sure, young.

IV: V. = 28; T. W. = 55.
Able, afraid, alive, awake, barefooted, busy, clumsy, darling, dear, delighted, fat, fond, funny, happy, ill, late, living, poor, quiet, ready, satisfied, smiling, sore, starched, strong, tender, tired, young.

e. *General*

II: V. = 12; T. W. = 35.
Bare, clean, dirty, furry, golden, greasy, naked, new, old, rainy, wet, woolly.

III: V. = 25; T. W. = 53.
Awful, bare, calm, clean, cosy, dangerous, dirty, like, lost, old, open, new, precious, real, rosy, sooty, spilled, steep, sunny, tangled, tough, tuggy, unbreakable, wet, windy.

IV: V. = 18; T. W. = 33.
Barbed, clean, different, difficult, dirty, easy, fizzy, like, new, old, open, precious, real, special, spotless, spick-an-span, wet, wound-up.

f. *Noun (used as adjective)*

II: V. = 10; T. W. = 23.
Apple, baby, Busby, country, darling, farm, flannel, girl, potato, rabbit.

III: V. = 24; T. W. = 34.
Baby, banana, birthday, Busby, china, daddy, deck-chair, dinner, gigot, good-night, hawthorn, india-rubber, Kilmarneck, lace, London, mother, nine-pins, ostrich, party, postoffice, Santa Claus, silk, summer, tongs.

IV: V. = 14; T. W. = 18.
Baby, birthday, button, Cathcart, chicken, Glasgow, glass, gooseberry, hot-water, orange, paper, prune, rose, velvet.

2. *Pronominal:*

II: V. = 2; T. W. = 8.
Your, own.
III: V. = 8; T. W. = 209.
My, his, her, its, our, your, their, own.
IV: V. = 8; T. W. = 187.
My, his, her, its, our, your, their, own.

3. *Demonstrative, etc.:*

II: V. = 5; T. W. = 59.
This, that, yon. Any, another.
III: V. = 9; T. W. = 127.
This, that, these. Any, other, another, else. Each, every.
IV: V. = 12; T. W. = 125.
This, that, these, those, such, yon. Any, other, another, else. Each, every.

3a. *Articles:*

II: V. = 2; T. W. = 57.
III: V. = 2; T. W. = 502.
IV: V. = 2; T. W. = 518.

4. *Interrogative:*

II: V. = 1; T. W. = 2.
What?
III: V. = 3; T. W. = 5.
Whose? which? what?
IV: V. = 3; T. W. = 27.
Whose? which? what?

5. *Quantitative:*

II: V. = 10; T. W. = 50.
One, two. No, none, all, half, enough, much, some, more.
III: V. = 12; T. W. = 88.
One, two, three, four, seven. No, all, whole, much, some, many, more.
IV: V. = 17; T. W. = 133.
One, two, three, four, five, six, dozen. Double. Second. No, all, whole, enough, much, some, many, more.

Verbs

Vocabulary: II, 146; III, 213; IV, 228.
Total Words: II, 1,168; III, 2,312; IV, 2,606.

1. *Intransitive:*

II: V. = 39; T. W. = 311.
III: V. = 61; T. W. = 665.
IV: V. = 62; T. W. = 775.

a. *Motion, etc.*

II: V. = 21; T. W. = 199.
Come, fall, fly, gallop, go, hang, hide, hurry, jump, lean, lie, rise, run, sit, stand, stay, turn, wait, walk, went, wriggle.
III: V. = 29; T. W. = 253.
Climb, come, dance, flit, fly, gallop, go, hang, hide, hurry, jump, lead, lean, lie, rise, run, sit, skip, slip, stand, stay, swim, tumble, turn, wade, wait, walk, went, wriggle.
IV: V. = 34; T. W. = 267.
Bend, climb, clump, come, disappear, drop, fall, fly, go, hang, hide, hurry, jump, kneel, lead, lie, race, reach, rest, run, rush, sit, skip, slide, stand, start, stay, step, stretch, toddle, trip, wait, walk, went.

b. *Natural process*

II: V. = 3; T. W. = 22.
Shine, sleep, waken.
III: V. = 8; T. W. = 15.
Belong, bleach, die, grow, pelt, shine, sleep, wither.
IV: V. = 12; T. W. = 16.
Bloom, drown, grow, happen, light, live, rain, set, shine, sleep, wake, wither.

c. *Personal action*

II: V. = 13; T. W. = 51.
Bark, cry, listen, look, play, shave, shiver, sing, sniff, spit, splash, squeak, work.
III: V. = 18; T. W. = 60.
Bite, care, coax, cock-a-doodle-do, cough, cry, golf, look, peep, play, sing, sniff, speak, sweat, talk, weary, whistle, work.
IV: V. = 10; T. W. = 68.
Cry, laugh, look, play, sing, smile, snap, speak, talk, vomit.

d. *Copula*

II: V. = 2; T. W. = 39.
Be, is.
III: V. = 6; T. W. = 337.
Am, are, is, be, was, were.
IV: V. = 6; T. W. = 424.
Am, are, is, be, was, were.

2. *Transitive:*

II: V. = 100; T. W. = 838.
III: V. = 140; T. W. = 1,103.
IV: V. = 157; T. W. = 1,184.

a. *Food, Dress, Household*

II: V. = 25; T. W. = 82.
Bake, boil, chew, cool, drink, eat, mash, scoot, sip. Comb, darn, mend, sew, tuck. Brush, clean, dry, light, pour, ring, screw, spill, wash, wheel, wipe.
III: V. = 31; T. W. = 80.
Bake, boil, drink, eat, heat, mash. Comb, curl, dirty, hook, pin, sew, tear, tie, tousle, wear. Brush, burn, decorate, iron, lock, paint, pour, red-stone, salt, spill, wash, wheel, wind, wipe, wet.
IV: V. = 29; T. W. = 76.
Butter, chew, cook, drink, eat, mince, swallow. Button, cast, darn, dirty, hook, mend, muddy, pack, pin, sew, soil, tie, wear. Burn, dry, hammer, ring, screw, spill, switch, wash, wind.

b. *Social actions*

II: V. = 19; T. W. = 72.
Buy, draw, post, read, say, write. Frighten, hurt, kiss. Bath, bite, clap, feed, jag, scratch. Ask, help, let, tell.
III: V. = 38; T. W. = 157.
Buy, count, draw, learn, lend, read, say, shew, steal, win, write. Assure, call, check, excuse, frighten, hurt, kiss, love, meet, thank, vex. Bear, choke, clap, cuddle, dress, eye-wink, feed, fit, kill, sting. Ask, beg, help, let, teach, tell.
IV: V. = 34; T. W. = 139.
Buy, answer, learn, read, say, show, write. Call, frighten, hinder, hurt, kiss, love, meet. Bath, cuddle, dress, fan, fit, kill, prick, protect, seat, serve, shelter, tilt, tuck, whip. Allow, ask, help, invite, let, tell.

c. *Mental*

II: V. = 11; T. W. = 210.
Like, mind, need, remember, require, think, try, want. Feel, hear, see.

III: V. = 20; T. W. = 273.
Dream, fancy, guess, know, like, mean, mind, need, pretend, remember, think, try, want, wish, wonder. Feel, hear, notice, see, touch.

IV: V. = 26; T. W. = 265.
Enjoy, fancy, forget, hope, know, like, mean, mind, need, pretend, remember, require, suppose, think, try, understand, want, wish, wonder. Feel, hear, notice, see, smell, taste, touch.

d. *General*

II: V. = 43; T. W. = 457.
Blow, break, bring, brush, carry, catch, cover, cut, do, dig, find, fetch, fold, get, give, hand, have, hold, keep, knock, leave, lift, lose, make, measure, meddle, open, pull, put, push, roll, rub, send, shut, smoke, sort, spread, squeeze, stir, take, throw, water, wave.

III: V. = 45; T. W. = 486.
Break, bring, cover, crowd, carry, catch, change, cut, do, find, finish, get, give, have, hold, join, keep, lay, leave, lift, lose, make, open, pass, pick, pull, push, put, roll, sail, send, set, shake, shut, sow, spoil, squeeze, swing, take, throw, upset, use, watch, wave, wire.

IV: V. = 59; T. W. = 582.
Arrange, bear, blow, break, bring, build, carry, catch, chalk, cling, cover, cross, cut, do, dig, find, finish, fling, gather, get, give, have, hand, hold, keep, kick, knock, lay, leave, lift, lose, make, miss, mix, move, open, paint, pass, peck, pick, press, pull, push, put, roll, rub, shift, shut, sink, skin, snatch, sort, spoil, stot, take, trail, turn, use, watch.

e. *Defective*

II: V. = 2; T. W. = 17.
Can, must.

III: V. = 6; T. W. = 107.
Can, could, may, might, must, should.

IV: V. = 6; T. W. = 122.
Can, could, might, must, ought, should.

3. *Auxiliaries:*

II: V. = 7; T. W. = 19.
Been, do, did, has, is, will, would.
III: V. = 12; T. W. = 544.
Am, are, been, be, do, did, have, is, was, will, would, were.
IV: V. = 12; T. W. = 647.
Am, are, been, be, do, did, have, is, was, will, would, were.

Infinitive (to):

II: V. = 1; T. W. = 10.
III: V. = 1; T. W. = 180.
IV: V. = 1; T. W. = 164..

Adverbs

Vocabulary: II, 46; III, 87; IV, 91.
Total Words: II, 546; III, 732; IV, 1,013.

1. *Time:*

II: V. = 8; T. W. = 37.
Again, first, never, once, soon, to-day, while, yet.
III: V. = 23; T. W. = 73.
Again, always, at first, at once, ever, long, long ago, more, never, now, often, on and on, once, one time, some day, some time, sometimes, still, then, to-day, when?, yesterday, yet.
IV: V. = 24; T. W. = 151.
After, again, ago, always; any more, before, directly, first, long, never, newly, now, often, once, sometimes, soon, still, then, to-day, to-morrow, to-night, when?, yesterday, yet.

2. *Place:*

II: V. = 18; T. W. = 307.
After, away, back, by, down, downstairs, here, home, in, on, off, out, over, round, there, up, upstairs, where?
III: V. = 25; T. W. = 269.
About, across, along, away, below, back, down, downstairs, here, high, home, in, near, off, on, out, out-of-doors, outside, over, round, there, through, up, upstairs, where?

IV: V. = 27; T. W. = 346.
About, away, back, behind, down, far, further, here, home, in, inside, lower, near, next door, nigh, off, on, out, outside, over, past, round, somewhere, there, up, upstairs, where?

3. *Manner:*
II: V. = 6; T. W. = 11.
Fast, fine, hard, right, so, well.
III: V. = 15; T. W. = 33.
Alone, better, carefully, easily, fast, how, loudly, nicely, one-by-one, quickly, right, slowly, so, tenderly, steadily.
IV: V. = 16; T. W. = 88.
Better, brightly, easily, fast, gently, goodly, how, loud, nicely, quickly, quietly, right, so, straightly, suddenly, tightly.

4. *Cause:*
II: V. = 1; T. W. = 1.
Why?
III: V. = 1; T. W. = 48.
Why?
IV: V. = 1; T. W. = 64.
Why?

5. *Degree:*
II: V. = 10; T. W. = 67.
All, awful, big, far, hardly, just, nearly, only, too, very.
III: V. = 18; T. W. = 132.
A bit, all, any, awful, enough, far, just, a little, more, much, nearly, only, plenty, quite, rather, so, too, very.
IV: V. = 18; T. W. = 188.
About, a little, all, as, ever so, enough, far, hardly just, much, nearly, only, perfectly, quite, so, terribly, too, very.

6. *Affirmation and Negation:*
II: V. = 3; T. W. = 123.
Maybe, not, surely.
III: V. = 5; T. W. = 177.
Iphm, not, maybe, perhaps, yes.
IV: V. = 5; T. W. = 176.
Likely, no, not, perhaps, really.

Conjunctions

Vocabulary: II, 7; III, 21; IV, 28.
Total Words: II, 9; III, 265; IV, 255.

1. *Co-ordinating:*
   II: V. = 4; T. W. = 4.
   And, so, then, well.
   III: V. = 7; T. W. = 172.
   And, but, for, so, then, too, well.
   IV: V. = 11; T. W. = 129.
   Also, and, but, for, now, of course, or, so, then, too, well.

2. *Subordinating:*
   II: V. = 3; T. W. = 5.
   After, when, whenever.
   III: V. = 14; T. W. = 93.
   After, as, because, before, if, in case, than, that, till, when, whenever, where, wherever, while.
   IV: V. = 17; T. W. = 126.
   After, as, because, how, if, in case, seeing, than, that, till, though, unless, until, when, whenever, where, why.

Prepositions

II: V. = 16; T. W. = 50.
About, after, at, beside, down, for, from, in, of, off, on, over, past, round, side, with.
III: V. = 27; T. W. = 432.
About, after, among, at, before, beside, between, by, down, for, from, in, inside, into, like, of, off, on, on board, out of, over, through, to, under, up, with, without.
IV: V. = 31; T. W. = 497.
About, across, after, among, at, behind, beside, by, down, for, from, in, into, like, near, of, off, on, out of, over, past, round, through, till, to, under, unless, until, up, with, without.

Interjections

II: V. = 10; T. W. = 13.
Ah, ahha, aw, eh, oh, please, nonsense, ow, tala, tut,
III: V. = 4; T. W. = 19.
Fie fie shame, oh, please, see.
IV: V. = 7; T. W. = 23.
Ah, aw, Hssh, oh, oh dear, oh dear me, please.

General Survey

It will be convenient, before going on to consider the meaning of the facts and figures comprehended in the three sets of words, to tabulate the results and express them in percentage form.

	Vocabulary						Total Words					
	Number			Per Cent.			Number			Per Cent.		
	II	III	IV	II	III	IV	II	III	IV	II	III	IV
Nouns	323	418	435	49.2	43.5	42.2	1528	1283	1289	36.8	16.4	14.8
Pronouns	18	30	37	2.7	3.1	3.6	257	1237	1577	6.2	15.8	18.1
Adjectives:												
Qualitative	69	125	131	10.5	13.0	12.7	395	428	380	9.5	5.5	4.4
Other adjectives	20	34	42	3.1	3.5	4.1	176	931	890	4.2	11.9	10.2
Verbs	139	201	216	21.2	21.0	21.0	1149	1768	1831	27.7	22.6	21.1
Auxiliaries	7	12	12	1.1	1.2	1.2	19	544	775	.5	7.0	8.9
To (Infin.)	1	1	1	.2	.1	.1	10	180	164	.2	2.3	1.9
Adverbs	46	87	91	7.0	9.1	8.8	546	731	1013	13.2	9.4	11.6
Conjunctions	7	21	28	1.1	2.2	2.7	9	265	255	.2	3.4	2.9
Prepositions	16	27	31	2.4	2.8	3.0	50	432	497	1.2	5.6	5.7
Interjections	10	4	7	1.5	.4	.7	13	19	23	.3	.2	.3
Total	656	960	1031				4152	7818	8694			

In the actual vocabularies, it will be noted, there is a steady increase with greater age in every case (with the insignificant exception of the interjections)—a large increase from 2 to 3, a small but quite definite increase from 3 to 4. The proportionate distribution of the several parts of speech affected by the changes due to age follows a rather different course. The percentage of nouns decreases very considerably from 2 to 3, and the decrease though smaller continues in the following year. Verbs, which with the nouns make up about two-thirds of the vocabulary, stand steady at 21% all through. In the proportions of the other parts of speech, there is a well marked advance from 2 to 3, followed in the next year by a slight advance or a slight retrogression. Taken as a whole, the percentage figures indicate a considerable difference between the vocabulary of the second year and that of the succeeding years, due chiefly to the preponderance of nouns and a deficiency in relational words. Not less striking is the similarity of the vocabularies of the third and fourth years. The percentage of verbs is the same, and there is only a small reduction in the proportion of nouns, qualitative adjectives and adverbs, and a small increase in the proportion of pronouns, adjectives other than qualitative, conjunctions and prepositions.

As might be expected, the figures relating to the total words reproduce (with some important exceptions) the main features of the Vocabulary Table. There is evident the same

general tendency to an increase in the number of words in each group year by year, except in the nouns, which stand about the same figure throughout,[3] and the adjectives and conjunctions, which are fewer in the fourth than in the third year. There is the same difference in the proportionate distribution of words between the second year and the other two, and the same resemblance between the third and fourth years, but the difference is greater and the resemblance is less. A very striking feature is the sharp fall from the second to the third year in the percentage of nouns, verbs, adjectives and adverbs, and the related rise in the percentage of pronouns, adjectives other than qualitative, auxiliaries, conjunctions and prepositions. The difference is obviously connected with the profound changes which take place in the course of the third year in the organization of speech.

Nouns: It is not possible within the scope of this article to do more than indicate the outstanding points of interest suggested by the lists of nouns. With a view to this, I give the percentage of the total words in the main groups of nouns in the three successive years.

		II	III	IV
1.	Body, etc.	4.6	9.2	9.1
2.	Food	10.0	5.9	6.0
3.	Dress	5.2	5.8	6.7
4.	Domestic, etc.	13.4	8.0	11.2
5.	House	2.8	3.9	4.5
6–8.	Topography, etc.	4.6	8.1	11.5
9.	Animals	8.0	7.6	6.0
10.	Plants	1.1	2.5	3.3
11.	Play, etc.	10.8	10.7	6.9
12.	Time, quantity, etc.	2.7	6.7	10.6
13.	People, etc.	38.3	28.3	20.3
14.	Ideal facts	1.0	3.6	4.0

These figures for the most part speak for themselves and need little commentary beyond the lists of words to which they refer. They show a relatively increasing use of words relating to parts of the body, dress, the parts and furnishings of the house, country objects, locomotion, plants, facts of time, quantity and position, and abstract ideas; and a relatively decreasing use of words having reference to food, household articles, animals, play and occupations, people and institutions. The reason is generally not difficult to find. There is obvious in some cases the gradual widening of the mental horizon that makes the facts of home life of less importance

[3] The child's own name occurs in the second year's list 231 times. Subtracting this, the figures are: II. 1297; III, 1283; IV, 1289.

and turns the attention further afield. In other cases (for example, in the remarkable progress in the use of quantitative terms, which is one of the distinctive features of the fourth year) there is evident a growth in the power to work with abstract ideas and relations. But why the decline in play words and in words referring to animals? Why again the marked decrease, especially in the fourth year, in words denoting persons of all sorts and particularly official persons, as well, as social institutions? There are certainly no other signs of a diminishing interest in such facts, and no deficiency of words relating to them in the complete vocabulary. The explanation would seem to be that verbal expression registers not the greatest interest but the greatest *new* interest.

Pronouns: One of the most noteworthy phases in the development of the child's vocabulary is the increasing part played by the pronouns. There are comparatively few pronouns in the two-year-old's speech, the only ones in easy use being the demonstratives. The number increases rapidly in the third year and continues to increase in the fourth year with the progress of the mind in generality. The following table, giving the whole number of pronouns used from 2 to 4, indicates the general character of the increase.

Personal	157	1043	1296
Relative	0	22	39
Interrogative	5	38	56
Demonstrative	83	102	131
Indefinite	12	32	55

The most interesting group is that of the Personal Pronouns, which are responsible for the greatest part of the increase. It is important to note that with the more frequent use of them goes a remarkable change in their character, which reflects the development of the child's social consciousness. This is clearly brought out by a percentage statement of the total number of the different pronouns of this group used at the three ages under consideration:

I*	64.2	51.4	40.6
We	.3	2.0	5.3
You	2.6	14.3	18.8
He, she, they	....	14.7	14.8
It	33.0	17.6	20.5

* With each pronoun I include its various forms: "me" and "myself" with "I"; "us" with "we" and so on. In the second year I have included the child's own name under the first personal pronoun; otherwise the comparison suggested would have lost much of its force.

The diminishing importance of the 'I' and the growing use of the other pronouns, especially of the 'we' and the 'you,' is a significant revelation of the process by which the self-centered child is transformed into a social being.

Adjectives: Quite a number of problems are suggested by the lists of adjectives. Why does such an important part of speech as the qualitative adjective occupy a progressively smaller place in the vocabulary in use? Why in the fourth year should there be an increase in sensory epithets and a decline in moral ones? Why should the pronominal and demonstrative adjectives after establishing themselves in the third year fall away in the fourth? We will seek an answer for these and similar questions, in the first instance, by examining the lists of qualitative adjectives. The total number of words in the several groups of these in the years under consideration, we find to be as follows:

Sense	40	40	55
Spatial, etc.	169	185	156
Moral and aesthetic	88	90	63
Human	40	26	55
General	35	53	33
Noun (used as adjective)	23	34	18

The striking fact here is that in every case the difference between the numbers in the third and fourth years is due to a very considerable increment or decrement, evidently the result of some change in the use that is being made of the particular group of words. The adjectives denoting largeness and smallness, which make up nearly a third of the qualitative adjectives in the second year, and which account for no little part of the total decrease by their shrinkage in the two succeeding years, will perhaps help us to an explanation. Here is a list of them with the number of times they occur.

II		III		IV	
Big	11	Big	43	Big	31
		Great	2	Great	7
				Huge	1
				Large	1
Little	1	Little	11	Little	36
				Small	1
Tiny	2	Tiny	6	Tiny	4
Wee	154	Wee	101	Wee	37
Total	168	Total	163	Total	118

The interesting fact brought out is that though there is a greater number of words less use is made of them. The greater number of words is understandable, but why the decreasing use? Presumably it is because the attributes which are explicitly stated become familiar and are subsequently omitted. The child begins by speaking about 'a *wee* baby,' then comes to take the weeness for granted as a characteristic of babies, and speaks only of 'a baby.' If this is the general process, the groups of adjectives which show an increment are those whose significance is only being realized, and which therefore need an explicit attribution. The adjectives which show a decrement, on the other hand, refer to familiar qualities whose presence is generally assumed without mention or only occasionally indicated. With the latter in the majority, the result is a decrease in the total number of adjectives. This explanation is supported by the fact that there is a small but definite decrease in the attributive use of adjectives and a corresponding increase in the predicative use from the second to the fourth year. The percentage of the whole number of adjectives which are used attributively is 75.3 in the second year, 72.6 in the third, and 70.6 in the fourth.

The same explanation applies to adjectives other than qualitative. Interrogative and quantitative adjectives occur in greater numbers with the advance in age, because the proper use of them depends on powers of mind which even in the fourth year are somewhat imperfectly developed. Pronominal and demonstrative adjectives, on the other hand, though presenting difficulties at 2, are used with freedom at 3, and are in less frequent evidence at 4.

Verbs: Beyond the broad division into Transitive, Intransitive and Auxiliary, it is difficult to classify the verbs employed by the child in such a way as to illustrate mental development, probably because there is a large number of verbs of vague and indeterminate reference, which do not fit exactly into any system of grouping. The classification I have employed is the least unsatisfactory of two or three which I have attempted to make. I give it without comment, because the many points it suggests would call for a greater amount of detailed discussion than it is possible to enter into here. One feature of interest, to which reference may be made is the paucity of defective, copulative and auxiliary verbs in the second year. This is one of the most characteristic features of the speech at this stage, and marks it off sharply from that of the two succeeding years. It is worthy of note, in this

connection, that when the defective are deducted from the other transitive verbs, and the copulative from the other intransitive verbs, the proportion of transitive to intransitive verbs in all three years stands almost exactly at three to one: the percentage of transitive verbs being—II, 75.1; III, 75.2; IV, 75.2.

Adverbs: The main changes which take place in the child's use of the adverbial qualification are indicated by a percentage statement of the figures already given in the three lists.

	Vocabulary			Total Words		
	II	III	IV	II	III	IV
Time	17.4	26.4	26.4	6.8	10.0	14.9
Place	39.1	28.7	29.7	56.2	36.7	34.2
Manner	13.0	17.2	17.6	2.0	4.5	8.7
Cause	2.2	1.1	1.1	.2	6.6	6.3
Degree	21.7	20.7	19.8	12.3	18.1	18.6
Affirmation, etc	6.5	5.8	5.5	22.5	24 2	17.4

The impression produced by the closeness of the percentages of the different groups of adverbs at 3 and 4 is that by 3 the child has acquired a tolerably complete equipment of adverbs and that for a year or two at least there is no substantial addition made to the working vocabulary at this point. This is confirmed by a consideration of the actual words used. But this does not mean that there is no development in adverbial modifications. The percentages of the total number of the different adverbs, on the contrary, shows that very considerable changes are going on. Adverbs of place which at 2 are more than half of all the adverbs used, while still numerous at 3 and 4, have become less important. Adverbs of time and manner, which though well represented in the vocabulary are much less in use, show a steady increase that reveals the progress of the mind from spatial to higher modes of thought. A like advance is indicated by the use of 'Why?', which only occurs once in the sentences at 2 but is well established at 3 and 4. Adverbs of degree also become more common, but as the increase is largely due to an irritatingly frequent use of the vague word 'just,' it has little significance. The only other point to be noted is the marked decrease of the negative in the fourth year.

Conjunctions: A simple index of the progressive development of sentence structure is furnished by the conjunctions. The total number occurring in the three collections of sentences was as follows:

Co-ordinating	4	172	129
Sub-ordinating	5	93	126

At 2, practically no conjunctions were employed. Of the 7 which appear in the vocabulary at that age, only one was used more than once, the exception curiously enough being 'whenever,' which was used three times. This must not be taken to imply that there were only simple sentences at 2. In point of fact, there were no fewer than 50 clauses which a grammarian would describe as subordinate, though in all but 5 cases the subordination was not marked by a conjunction or other special word. In the course of the third year, conjunctions of all kinds became common. In particular, the words 'and' and 'but' were much in evidence. It is one of the unexpected differences between the third and the fourth years that both of these words and especially the latter were less frequent in the fourth year, with the result that the number of co-ordinating conjunctions showed a very considerable drop. Against this, there is a decided increase both in the number and variety of the subordinating conjunctions: the percentage of these at 3 is 35.1, while at 4 it reaches no less than 49.4. The difference is mainly accounted for by the appearance of noun clauses introduced by 'how' and 'that,' and adverbial clauses of comparison introduced by 'than' and 'as.' 'When,' 'if,' 'because,' are equally prominent on both lists.

Prepositions: Beyond the fact that there is a large increase in the use of the prepositions between the second and the third years and a small increase between the third and fourth, there is not much to be said about the prepositions. The lists of the prepositions used at 3 and 4 include all the ordinary prepositions in adult speech.

Interjections: An interjection not being a proper part of speech, it was not to be expected that the interjections would figure largely or typically in the collections of sentences which have formed the basis of the present study. It does not seem to me at any rate that any conclusions can be drawn from the scanty lists of interjections which they furnish.

The Complete Vocabulary at Three and Four

With a view to a comparison between the complete vocabulary and that part of it contained in the collected sentences, I proceeded to make a record of the complete vocabulary as soon as I had finished the grouping of the words in the sentences. During the month which it took to classify the working vocabulary, I only jotted down exceptional words which might chance to be overlooked at a later time. Then in the following month, I collected assiduously every word which might conceivably be absent from my first lists. At the end of this month, I went over these first lists, struck off the ephemeral words and some words (such as nouns used as adjectives) which had been duplicated, and then put the new collection of words under their proper headings. But I knew that there was still a very considerable number of words which the child could use quite well, even though they did not happen to have been used during the two months over which my collecting had extended. To get these with as much certainty as the case permitted, I then compiled a further list of words which might possibly be in her vocabulary. Some of these were suggested by a study of the lists of assured words, the grouping of which was very helpful for this purpose. A number were got in the third year by scanning the second year lists, and in the fourth year by scanning the third year lists. A few were got by a cautious use of the vocabularies published by previous investigators. With the assistance of the child's mother I scrutinized the list of possible words, and tested the doubtful ones as far as I could, by trying to get the child to use them. In this way, I succeeded in making as complete and as accurate a record of the child's actual vocabulary as one could reasonably expect to make.[1]

---

[1] In the vocabularies compiled by me, the past tense and past participle of verbs are not included, except in a few abnormal cases (e. g., 'go' and 'went'). The practice of including these parts of the verb seems to me a foolish one, calculated to confuse the vocabulary as an expression of mental content and to add unnecessary difficulties to the comparison of different children's vocabularies or of the vocabularies of the same child at different ages. There is some slight justification for it in the case of two-year-old children, though even then the beginnings of the distinction between form and content are occasionally to be seen. There is none whatever in the case of four-year-old children, who are generally able to form the past tense and past participle of any verb. If these parts are to be included, consistency demands the inclusion of the plurals of nouns as well.

I give a numerical statement of the results without further comment:

	Complete Vocabulary			
	III	IV	III	IV
Nouns	918	1441	55.4	55.5
Pronouns	30	38	1.8	1.5
Adjectives:				
Qualitative	165	294	10.0	11.3
Other adjectives	35	70	2.1	2.7
Verbs	344	541	20.8	20.8
Adverbs	109	140	6.6	5.4
Conjunctions	21	31	1.3	1.2
Prepositions	29	33	1.8	1.3
Interjections	6	10	.3	.4
Total	1657	2598	100.1	100.1

THE VOCABULARY OF A THREE-YEAR-OLD GIRL

By Arthur Dermont Bush, M. D.

Introduction

This vocabulary is offered as a contribution to the data for the growing science of psychogenetics. Just such additions to the present isolated groups of observations will, in time, provide sufficient material for reliable averages and generalizations. The existent state of our knowledge of psychogenetics is such that tentative conclusions only may be justly drawn. In but a few cases have careful, scientific observations been made of the daily life of a child; yet by such a daily record, only, can trustworthy data be secured. A model of such work is Preyer's.

Studies of children's vocabularies are scattering and few; moreover, such studies must necessarily show considerable variation, because of parental proclivities; they will probably show, also, a record considerably above a normal average inasmuch as the studies will usually be made by parents having studious habits,—mental conditions inevitably reflected in the vocabularies of the children. Few such studies will be obtained from children of the lower middle classes, or those below, as the parents have not the leisure, patience or inclination necessary for compiling vocabularies. Even among those more favored of fortune, the necessary assiduity is too often lacking. Such vocabularies as appear should, therefore, be accompanied by brief histories of the child, its environment, and its parentage. These will serve to check undue estimates as to reasonable averages, or erroneous deductions as to possible demands of other children.

The child, B, was conceived in religiously-intense philoprogenitiveness, nurtured antenatally with thoughtfulness and care, and trained since birth with that form of love that endeavors to always place childhood welfare over and above parental comfort and selfishness. At the age of three months, because of inadequate nourishment, the child was transferred, much to the mother's disappointment, from the breast to the bottle, her diet becoming then cow's milk modified, at first, by percentage solutions, later, by dextrinized flour. Her first year was spent in a suburb of Boston very much under the

personal attention of both parents. Her second and third years were spent in a beautiful city in northern Vermont. During most of this time she has had very few playmates, losing thereby somewhat of social development, but gaining greatly in comparative freedom from interfering cross-currents. In the past six months her social life has greatly broadened bringing with it much good, and some ill. She is now, at the age of three years, a sweet winsome little girl, happy of disposition, very loving and lovable, strong and well of body (having had no illness since birth more severe than bowel disturbances and "colds"); keen and bright of mind, quick to comprehend and eager to learn.

The parents were both over thirty at the date of the child's conception. Both are of the brunette type, the mother being slightly the darker. Both were born of middle-class parents, and both have improved their inheritance. Dispositions congenial.

The mother is a normal-school graduate (Mass.), with six years' successful experience as a teacher in the grade schools. She is a lover of nature and the great outdoors, a theoretical suffragist, a woman of high ideals, and a devoted wife and mother.

The father, who is also the child's chum, had as a boy left the factory after six years discontent as a day laborer. Fitting himself for college he later took up the study of medicine, became a practitioner for four years, then an all-time teacher. He is a lover of music and fine literature, a scientific dreamer, an agnostic in philosophy, and an insurgent in pedagogy and politics.

While there has been no attempt to force the child, there have been studied efforts at constructive play, at directing the child's bounding energies into fruitful channels. Meaningless playthings have been tabooed; instead, articles of adaptive utility have been provided as completely as possible. At the age of two, the child was given the Montessori outfit (as an experiment), and quickly learned to build the "stairs," rightly place the cylindrical insets, correctly assemble the geometrical insets, and harmoniously assort the sixty-four color cards. At present the balance of the outfit interests her but little, and is, therefore, neglected in favor of outdoor interests for the summer. Methods of child culture as suggested by Pryor, Hall and Armstrong, and as scantily indicated by Sidis and Berle, have been carefully weighed and utilized as available. Very early with her dawning comprehension the parents reasoned with her, not only as to the *wherefore* of things but also as to the *why* of conduct. This greatly stimulated the

child's associative faculty, and bred a developing habit of weighing and comparing. True, this makes response in obedience occasionally tardy, but it creates a spirit of understanding and an intuition of justice that makes discipline a relatively simple matter. The suggestion made by Berle that explanations to a child should be both voluminous and discursive has found satisfactory utilization in the present case.

It must not be understood that the present vocabulary comprises all the words the child makes use of, but simply those which for the child have a *definite connotation capable of being again intelligently used in some other relationship.* She knows, for instance, a considerable number of musical rhymes which she repeats with an evident appreciation of the cadence and rhythm; but in these rhymes occur many words which for her have little or no meaning; and these words have not been included in the list. There are also not included a considerable number of original sounds which, though presumably expressing something to her, yet obviously are not recognized by grammarians. Some original compounds, likewise, though connoting understanding as, for example, "*ungarter* my stockings," or "I do not wish to go to bed *mylone,*" are necessarily not included. Some words represent unfortunate contributions from other children, as, for example, "slap" and "kick,"—words she has never heard in her home, and words whose meaning she has never personally experienced except in association this summer with neighboring children. (It is believed that much of this child's sweetness of manner may well be ascribed to the entire absence in her home life of the brutalizing influence of personal violence.)

The words here given are words she has intelligently used during the past six months. They have been grouped grammatically, the better to illustrate the exact sense in which they were employed, as well as to facilitate study and reference. Plurals of nouns have not been counted except where differences of spelling justified. Verb inflections have been counted where the verb is irregular, where the tense form demands, and where the participle was involved. Fine distinctions as to adverbs may be called in question though this classification is of course more or less artificial; it does not affect the usage, however. The details as to pronouns simply represent the varieties of observed use; the object of so classifying is to bring out these variations.

To some it may at first seem that a word has been counted more than once; but such enumeration is justified by the sense in which the word is employed. For example, the word "that" occurs three times: (1) as an adjective, (2) as a

demonstrative pronoun, and (3) as a conjunction; but since the word each time has a separate meaning, we may rightfully hold that it has a logical independence. Examples: (1) "That dog might bite me," (2) "Whose hat is that?" (3) "Mama, Papa says that I may go."

Method

The method of making up B's vocabulary was as follows: (a) For six months previous to the child's third birthday records were kept by the father and mother of all the words the child was heard to use; (b) a week previous to the third birthday, a small dictionary was scanned for such words as discreet tests proved were being used intelligently by the child; finally (c), comparison was made with the published vocabulary of a three-year-old boy (Whipple, *Pedagogical Seminary*, 16, 1, 1909), and several more words were thereby obtained.

Nouns

Ache
afternoon
air
animal
ankle
ant
anybody
anything
apple
applesauce
apron
arm
ashes
asparagus
aunt
automobile
ax

Baby
back
backside
bacon
bag
ball
balloon
banana
band
bang
banister
bank
bar
barn
barrel
basin
basket

bath
bathrobe
bathroom
bathtub
beach
bead
beans
bear
bed
bedroom
bedclothes
bedtime
bee
beefsteak
bell
beets
bill
belly
bellyband
belt
berry
bib
bicycle
bird
birthday
biscuit
bit
bite
blackberry
blackbirds
blanket
blocks
blood
blossom
boat

board
body
bone
bonnet
book
bookcase
bottle
bouquet
bowels
bowl
box
boy
bread
breakfast
breast
breath
bridge
brook
broom
brother
brush
bubble
bud
buffalo
buffet
bug
building
bump
bunch
bundle
bunny
bureau
burn
bush
butter

buttercup
butterfly
button
buttonhole
buttonhook

Cabinet
cage
cake
camel
can
candle
candy
cane
canine (tooth)
cap
cape
car
card
carnation
carpet
carriage
cart
cat
caterpillar
ceiling
celery
cent
centre
cereal
chain
chair
chalk
chamber
cheek
cherry
chiffonier
child
children
chimney
chin
christmas
christmas-tree
chum
chicken
chocolates
church
circle
circus
claws
clock
closet
cloth
clothes
clothesline
clothespins
cloud
coal
coat
cocoa
collar
college
color
comb
common-pin
company
compasses
cookies
cork
corn
cornmeal
corner
cornflakes
couch
cotton
cough
count
cover
cow
crack
crackers
cradle
cranberries
crank
crayon
cream
crib
croquet
crow
crumb
crust
cry
cuff
cuff-buttons
cup
curbstone
curl
curtain
cushion
custard
cut
cylinder

Daddy
daisy
dance
dandelion
darling
daughter
day
daytime
decorations
deer
dent
desk
dessert
diaper
diarrhoea
dimple
ding-dong
dinner
dining-room
dipper
dirt
dish
doctor
dog
doll
dolly
door
dove
drawer
drawers
dream
dress
dresser
drink
drive
drop
drum
duck
dust
dust-pan

Ear
egg
elbow
elephant
end
enema
engine
envelope
evening
everything
eye

Face
facecloth
fall
fan
fat
father
feather
feet
fence
field
fig
finger
fingernail
fire
firebell
fireengine
fireplace
fish

fist
flag
flame
flash
flatiron
flies
floor
flour
flower
fly
folks
food
foot
forearm
forehead
fork
fountain
fox
friend
front
fruit
fudge
fun
fur
furnace

Game
garbage
garden
garret
garter
gas
gate
geese
gift
giraffe
girl
glass
glass (water)
glove
glue
goat
gold
goose
grammy
granddaughter
grandfather
grandmother
grandpa
grape
grass
gravy
grease
greens
grip
grocery

ground
gum
gums
gutter

Hair
hairbrush
haircomb
hairpin
half
hall
hammer
hammock
hand
handful
handkerchief
hash
hassock
hatchet
hat
hay
head
headache
heap
heat
heel
hen
hiccough
high-chair
hill
hip
hoe
hole
holly
home
honey
hood
horn
horn (cow's)
horse
horseback
hose
hospital
hotel
hour
house
hubby
hug
hurry

Ice
icecream
Indian
ink
insect
iron

ironing-board
island

Jack o lantern
jambalaya*
jar
jaw
jelly
jewelry
johnny-cake
joke
jug
juice
jumprope

Kettle
kewpies
key
kick
kid
kimona
kind of
kiss
kitchen
kitten
kitty
knee
knife
knock
know

Laboratory
lace
ladder
lady
lard
lake
lamb
lamp
land
lantern
lap
laugh
lawn
lawn-mower
lead-pencil
leaf
leak
leaves
leg
leggings
lemon
lens
letter
lettuce
library

* A Southern dish composed of rice, shrimps, etc.

lid
light
lightning
line
linen
lion
lip
loaf
lock
locket
look
lot
lullaby
lump
lunch

Macaroni
machine
magazine
mail
mailman
man
ma
mama
marbles
mark
market
mat
match
matter
mattress
meadow
meal
meat
medicine
men
mess
middle
milk
milk-bottle
milk-man
mill
minute
mirror
miss
mister
mitten
moment
money
monkey
moo
moon
moonlight
moose
mop
morning
mosquito
mother
mountain
mouth
mouthful
movement
mud
muff
muffin
mug
mush
music
music-box

Nail
name
nap
napkin
napkin-ring
neck
neckpiece
necktie
needle
newspaper
night
nightdress
nightgown
nighttime
nipple
noise
noon
nose
nothing
nurse
nut

Oar
oatmeal
office
oil
ointment
olives
omelet
opening
orange
oven
overcoat
owl
oyster
oxen

Package
packing
page
pail
pain
paint
palm
pan
pansy
pantry
papa
paper
paper (news)
parade
parasol
parcel
pardon
park
parlor
part
party
path
pavement
pea
peach
peanut-butter
pear
pearl
pecan
pedals
pen
pencil
penny
people
pepper
peppermint
person
pet
petticoat
piano
piazza
picnic
picture
pie
piece
pig
pigeon
pile
pill
pillow
pin
pin-cushion
pine
pipe
pitcher
place
plane
plant
plaster
plate
play
playmate
playtime
pleasure
plenty
plum

pocket
pocketbook
point
poker
pole
pond
pony
post
postcard
postman
post-office
posy
pot
potato
powder
presents
prison
professor
pudding
puddle
puff
puffed rice
puffed wheat
pug
pumpkin
purse
pussy

Question
quilt

Rabbit
race
racket
radish
rag
railroad
rain
rainbow
raisins
rake
rap
raspberry
rat
razor
reader
reflection
refrigerator
reins
rhubarb
ribbon
rice
rim
ring
ringing
rip
river
road
roar
roast
robe
robin
rock
rocking-chair
rod
rogue
roller
rompers
roof
room
root
rope
rose
row
rubber-band
rubbers
rubbish
rug
ruler
rut

Safety-pin
sail
salad
salt
saltcellar
saltines
salve
sand
sandals
sandpaper
sandwich
sauce
saucer
saw
scent
school
schoolboy
schoolgirl
scissors
scratch
scream
screen
screws
screwdriver
scum
sea
seat
second
seed
see-saw
sewer
shade
shadow
shavings
shawl
shed
sheep
sheet
shelf
shell
ship
shirt
shoe
shoestring
shop
shore
shoulder
shovel
shower
shreddedwheat
shrimps
sickness
side
sidewalk
sieve
silk
silver
sink
sip
sir
sirup
sister
sitting-room
skin
skirt
skull
sky
slat
slate
sled
sleeve
slippers
slide
sliver
slumber-song
smack
smell
smile
smoke
sneeze
snow
snowball
snowman
snowplow
soap
soapbubbles
soapsuds
sob
socks
soda
soldiers

sole
somersets
somebody
something
son
song
sound
soup
sparrow
speck
spider
spinach
splash
splint
sponge
spool
spoon
spoonful
spot
spray
spread
squash
squeal
squeeze
squirrel
stain
stair
staircase
stamp
stand
star
starch
station
steam
steamboat
steamengine
steamroller
steeple
stem
step
steps
stew
stick
stocking
stomach
stone
stool
stopple
store
storm
story
stove
strap
strawberry
street
string
strop
study
stuff
stuffing
stump
stunt
suds
sugar
suit
sun
sunburn
sunbonnet
sunlight
sunset
sunshine
supper
suspender
sweater
sweetheart
swing

Table
tablecloth
tacks
tail
tag
tan
taste
taxi
tea
tea-kettle
team
teapot
tea-party
tear
tears
teddy-bear
teeth
telephone
tent
thermometer
thigh
thimble
thing
thread
throat
thumb
thunder
thunderstorm
tick
tie
tiger
time
toast
today
toe
toe-nail
toilet
tomato
tomorrow
tongue
tonight
tooth
tooth-brush
top
top (toy)
touch
towel
tower
town
toy
track
train
tray
tree
treetop
trick
trimming
trolleycar
trousers
trunk
tub
tunnel
typewriter

Umbrella
umbrellarack
uncle
underdrawers
union-suit
university

Vanilla
vase
vegetable
velvet
verse
vine
vinegar
violet
violin

Wagon
waist
waistband
waistcoat
walk
wall
washboard
washcloth
washing
watch
water
waterfall
watering-cart

watering-pot
wave
way
weather
weeds
wheel
wheelbarrow
whip
whipped cream
white-meat
wind
wind-mill
window
window-seat
wink
wire
wolf
woman
worm
wood
woods
word
wringer
writing
writing-paper
Yard
yarn
yawn
year
yeast
yesterday
Zebra

Proper Nouns

Athol
Boston
Burlington
Christmas
Ethan Allen Park
Grassmount
Hungerford Terrace
Jupiter
Main Street
Venus
Woburn

Names

Arthur
Bladen
Cyril
Duncan
Ebbert
Emerson
Eustace
Fred
George
Herbert
Jack
John
Kenneth
Louis
Merrell
Ralph
Richard
Rodney
Walker

Abbie
Adeline
Bessie
Bettina
Dorothy
Edna
Eleanor
Geraldine
Gladys
Grace
Gretchen
Harriet
Helen
Hilda
Irma
Janet
Katherine
Lois
Lucy
Mabel
Margaret
Minnie
Pauline
Peggy
Ruth
Susan
Ursula

Surnames

Brown
Bush
Dalton
Howard
Jenks
Joseph
Ogle
Maier
Patten
Perkins
Reeves

Pronouns

Personal

I	me	my	mine	myself
you	you	your	yours	yourself
he	him	his	his	himself
she	her	her	hers	herself
we	us	our	ours	ourselves
they	them	their	theirs	themselves
it				

Relative

who	whom	whose	which	as

Interrogative

what which who

Demonstrative

that this these those

Adjective Pronouns

all neither no none own same some

VERBS

Ache
am
answer
are
aren't
ask
ate

Back
bake
bang
bark
bathe
bathing
be
been
beg
begin
believe
belong
bend
bite
bleed
blow
bounce
break
breathe
bring
broke
broken
brought
brush
buckle
build
building
bump
burn
burnt
burst
butter
button
buy

Call
can

cannot
carry
catch
change
chew
clap
clasp
claw
clean
cleaning
climb
cling
close
closed
comb
come
coming
cook
cool
cough
could
count
cover
crack
crank
crawl
creep
creeping
crumb
cry
crying
curl
cut

Dance
dancing
desire
did
didn't
dig
dip
disturb
do
doing
does

done
dont
double
drag
drank
draw
dream
dress
drink
drive
drop
drum
dry
dump

Eat
empty
excuse
expect
explain

Fall
fan
fasten
feel
fell
felt
fetch
fill
find
fix
fixing
fixed
flop
fly
flying
fold
forget
forgot
found
freeze
frighten
fry
frying

Gather
gave
get
getting
give
go
going
gone
got
grab
grasp
grind
ground
grow
growl
guess

Had
hammer
hand
handle
happen
harm
have
has
heal
heap
hear
heard
held
help
hiccough
hide
hiding
hit
hold
hook
hop
hope
hug
hurry
hurt

Intend
invite
iron
is
itches

Jar
jingle
jingling
joggle
jounce
jump

Keep
keeping
kept
kick
kill
kiss
kissing
kneel
knock
knot
know

Lace
laceing
laid
laugh
laughing
lay
laying
lead
leak
lean
leave
left
let
lie (recline)
lift
like
listen
live
lock
look
looking
lose
lost
love
lunch

Made
make
make believe
march
mark
may
meet
melt
mend
mew
might
mix
moisten
mop
move
moving
must

Name
need
Obey
observe
offer
offering
oil
open
ought

Paddle
parade
pardon
pare
pack
paint
pass
passed
pat
pay
peel
packing
peeking
pet
pick
pile
pin
place
plant
play (ball)
play (piano)
please
point
pound
pour
powder
prefer
prick
print
promise
pull
push
put

Race
rain
raining
raise
raising
rake
ran
rap
reach
read
reading
reason
refreshing
remember
remove

repeat
rest
resting
return
ride
riding
ring
rinse
rip
rise
rock
rode
roll
romp
row
rub
run
running

Said
sail
sang
sat
save
saw
saw (p. of see)
say
saying
scamper
scare
scatter
scorch
scratch
scream
screaming
scrub
search
see
seeing
seen
sell
send
serve
set
sew
shake
shall
shave
shaving
shine
shining
shook
should
shout
shovel
show
shut
sing
sink
sip
sit
sitting
skip
slap
sleep
sleeping
slide
slip
smash
smell
smelling
smile
smoke
snap
snarl
sneeze
snow
snuggle
soak
soap
sob
soil
sop
sour
spatter
speak
spell
spend
spill
spin
spit
splash
spoil
spray
spread
sprinkle
spurt
squat
squeal
squeeze
squirm
stain
stamp
stamping
stand
standing
start
stay
steady
sleep
steer
step
stick
stir
stood
stoop
stop
strap
strike
stub
study
suck
suit
suppose
surprise
swallow
sweep
swim
swing
swinging

Take
talk
talking
taste
teach
tear
telephone
tell
thank
think
thinking
thought
throw
throwing
thunder
tick
tickle
tie
tip
tipping
tire
toast
told
took
tote
torn
toss
touch
trim
trot
try
trying
tuck
tumble
turn
turning

Unbutton
undo
understand
undress
unhook

unlace
unlock
untie
unwind
use

Visit

Wade
wait
wake
waked-up
walk
want
warm
was
wasn't
wash
washing
waste
watch
watching
water
wave
wear
went
were
wet
wheel
whisper
whistle
will
wind
wink
wipe
wish
wonder
won't
work
worn
would
wouldn't
wring
write
wrote

Yawn
yawning

ADJECTIVES

A
afraid
all
alone
an
another
any
asleep
aunt
awake

Bad
bare
barefoot
barehead
beautiful
best
better
big
black
blessed
bloody
blue
both
broken
brown
busy

Careful
chilly
clean
close
cold
colder
comfortable
cool
cunning
Damp
dark
darling
dead
dear
deep
delicious
different
dirty
double
dry
dusty

Each
easy
else
empty
every
enough
empty
expensive

Far
farther
fast
faster
fat
few
fine
first
five
flat
fortunate
four
fresh
fried
full
funny
further
Gentle
glad
gold
good
grand
gray
great
green

Happy
hard
heavy
high
horrid
hot
hubbly
hungry

Icy
inside

Jolly
juicy

Kid
kind

Large
last
late
left
less
light
little
long
longer
loud
lovely
low

Main
many
miserable
moist
more
most
much
muddy

Naked
nasty
near
necessary
nice
noisy
no good
none
naughty

Old
one
other
open
orange

Patient
pink
pleasant
poor
possible
pretty
prickly
purple

Queer
quick
quiet

Ragged
rainy
raw
ready
real
red
right
ripe
rocky
rotten
rough
round
rusty

Safe
same
scarlet
shady
sharp
short
sick
simple
sleepy
slow
small
smooth
snug
soapy
soft
solid
some
sore
sorry
sour
sticky
straight
strong
such
sunny
sure
sweet

Tall
tan
that
the
these
thick
thirsty
this
those
three
tight
tiny
tired
toasted
two

Uncle
uneven
unhappy

Violet

Warm
warmer
weary
welcome
well
wet
what
which
white
whole
wide
willing
windy
wonderful
wrong
wrong-side-out

Yellow

Adverbs

Time

afterwards
again
by and by
first
last
next
now
once
presently
since
sometime
soon
then
together
when
while
yet

Place

ahead
away
back
backwards
behind
down
down-stairs
here
in
inside
off
out
outdoors
outside
somewhere
there
upstairs
where

Manner

also
awfully
carefully
fast

how
sidewise
so
slowly
quickly
quietly
neatly
nicely
snugly
softly
usually
well
why

Degree

almost
along
besides
closely
easily
how
just
nearly
often
quite
pretty
though
too
very

Modal

no
not
surely
certainly
perhaps
indeed
probably
really
yes

PREPOSITIONS

about
above
across
after
against
among
around
as
at
before
behind
below
beside
between
by
for
in
if
into
instead of
of
over
on
since
through
to
under
underneath
up
upon
with
within
without

CONJUNCTIONS

and
because
but
neither
or
so
than
that
unless
until
whether

INTERJECTIONS

ah
good-by
good-morning
good-night
gracious
hark
hello
how-do-you-do
hurrah
indeed
oh
pop
quack
whoa

COMMENTS

It must be understood that the foregoing is a *child's vocabulary*. Necessarily the mental content is not that of an adult, quantitatively, though there seems small reason for doubting the qualitative identity. Children, even as adults, occasionally have wrong concepts, but as a rule their ideas are largely the ideas of the parents and are probably as nearly identical, at least, as would be those of two adults of unequal intellectual endowments.

Size: As Whipple has said, the general opinion as to the extent of a child's vocabulary is far astray. The request for a guess as to the vocabulary of a three-year-old was made of

a large number of people. The highest guess was "not over 1,000;" the lowest guess was 50; the average of all the guesses was between 200 and 300. Parents were as far astray, usually, as were single people, though the guess of 1,000 was made by the mother of five-year-old twins. All seemed greatly surprised, some even incredulous ("from Missouri"), when told that B's vocabulary contained over 1,900 words.

Comparison: The only detailed vocabulary that is comparable with B's is that of Whipple's three-year-old boy. The relations of these two vocabularies is shown by the following table:

DIFFERENT PARTS OF SPEECH, WITH PERCENTAGES

Observer	Age of Child	Sex	Total Words	Nouns	Pron.	Adj.	Verbs	Adv.	Prep.	Conj.	Int'j.
Whipple.....	3	M	1771	993	33	209	391	89	24	8	24
			%=	56.1	1.8	11.7	22.1	5.0	1.3	0.5	1.3
Bush.....	3	F	1944	1042	50	214	506	75	33	11	14
			%=	53.5	2.6	10.9	26.0	3.9	1.7	0.5	0.7

The principal advantage the girl, B, has over the boy, R, seems to be in the use of verbs, she having a numerical excess of 115. In nouns, her excess is 49; in pronouns, 17; in adjectives, 5; in prepositions, 9; and in conjunctions, 3. The boy has an excess over the girl in adverbs of 14; and in interjections, of 10. This excess in interjections is a questionable one inasmuch as Whipple counts as legitimate such expletives as "choo," "hip," "pash," "why-senses," etc. The girl has a variety of expletives, but none except those commonly accepted were counted. Whipple included also such expressions as "fullest," "goeomes," "morowsky," "snootikins," and so on, words which certainly have no authoritative acceptation, and, hence, are not valid, even though interesting. It seems to me that a valid vocabulary should contain words of accepted usage only; and such words being those only which the child employs intelligently. This interpretation would exclude a number of words which Whipple has counted, such as numerals above five, unusual or original terms and expletives, and probably the names of the days of the week. But this elision in R's vocabulary would probably be compensated numerically by many other words not recorded but presum-

ably known, such as " cake," " cheek," " father," " fire-engine," " large," " papa," " ran," etc. As to numerals, B can count correctly to twelve; but with her this is chiefly a knowledge of the correct sequence of counting sounds; her apperception of number is not clear as yet beyond the group of five.

A very interesting comparison between the vocabularies of R and B consists in the number of words common to both, and the number peculiar to each. There are about twelve hundred words which both use in common, about 570 that R uses that B does not, and about 750 that B uses that R does not.

Color sense: B has a very quick eye for color values, as is shown by her very quick assortment of the 64 shades of eight principal colors in the Montessori scheme, and by her appreciative comments on beautiful ribbons, pictures, and sunsets. Immediately and without hesitation she will correctly select and name the following: white, black, gray, tan, pink, violet, blue, green, yellow, orange, red and gold; less surely, browns, scarlet and purple. As Whipple remarks, this degree of color knowledge is above the average. It is due largely to the following: (a) favoring opportunities for learning colors, a condition not present in many homes; and (b) an eye sensitive to color. It should be more generally recognized that color delinquencies are largely due either to optical deficiencies or to relative color insensitiveness,—on the part of the parent or child or both. Any normal child of color sensitiveness equal to B's could probably be taught as many colors if the parents were diligent in carefully associating the correct color terms.

THE DEVELOPMENT OF PSYCHOLOGICAL CLINICS IN THE UNITED STATES

By Theodate L. Smith

Within the last decade, the terms clinical psychology and psychological clinic have become familiar but with a vagueness of meaning which leaves much to be desired. Psychological clinic has apparently been used to designate types of work ranging from a more or less mechanical and amateur application of the Binet-Simon tests to that of a well equipped laboratory where diagnosis is based not only upon mental tests of various kinds but upon as full a knowledge as possible of the heredity, environment, personal and family history of the patient and the possible correlation of these factors with mental and physical peculiarities. But the explanation of the psychological clinic and its work is to be best found in a description of its actual development. The following brief sketch makes no claim to completeness, but data thus far gathered are used to indicate the lines of development and possible future of an institution as yet only in the beginnings of its usefulness.

The first psychological clinic in the United States for the study of exceptional children was established by Professor Lightner Witmer of the University of Pennsylvania in connection with the psychological laboratory of that institution. While originally founded as a result of Dr. Witmer's interest in mentally and morally retarded children, its work is not limited to these but includes in its scope any child who deviates from the average, the precocious child and the genius as well as the mentally defective. As the work progressed, the need of some place where children could be kept under expert observation for longer or shorter periods of time became keenly felt and as a result, a special hospital school was established for the care and treatment of such children as seemed to need prolonged observation and training in order to arrive at a satisfactory diagnosis of their mental status.

Children may be kept here under training for any period ranging from a few days to six months, or even in some cases a year.

The second psychological laboratory to be established in the United States developed under quite different auspices. In 1898 Dr. R. T. Wylie, a physician and psychologist, received an appointment at the State Institution for the Feeble-Minded at Faribault, Minn. In the intervals of other work, Dr. Wylie devoted himself to making psychological tests of the children in the institution. In 1900, the Faribault laboratory was provided with seven rooms for research and clinical work, including not only psychology but bacteriology, facilities for photography and a fair equipment of apparatus. Dr. Wylie made studies of sensory acuity and ergograph and memory tests, in the intervals of other work, and these early experiments have now led to the establishment of a regular department of research under the direction of Dr. Fred Kuhlmann, who devotes his entire time to systematic and intensive studies of the children in the institution.

In 1905, as a result of persistent efforts on the part of Mr. Johnstone, Superintendent of the Training School for Feeble-Minded at Vineland, N. J., a department of research was established there, which is supported by private endowment and contributions quite separate from the funds of the institution. Dr. Henry H. Goddard was appointed psychologist and under his direction the work has steadily increased in extent and importance.

From the first he has worked toward the idea of obtaining as complete information as possible of each child during his lifetime and supplementing this by the findings of an autopsy, whenever this was permitted. The physical, mental and social traits of each patient are studied and his ancestry traced as far back as possible in both direct and collateral lines. The Institute of Anatomy at Philadelphia has given its aid in the matter of autopsies though as yet these have been comparatively few in number. The staff of the department has been steadily increased as funds permitted and in 1912 consisted of the director and eight assistants. Three of the latter are employed in the field work of collecting family histories while the remainder devote their time to the work of testing and observing children, doing the routine work of care taking, and working out a system of classification. In 1909, a division of medical research was established and a physician appointed who devotes practically her entire time to research in this field. A complete physical examination is made of every child at the time of his entrance to the school and periodically afterwards. Wasserman, tuberculin, blood tests and urine analyses are made, and experiments in feeding thyroid and other glandular extracts to certain groups of children have been

tried. In 1912 a department of biochemistry, with a working force of a director and two assistants was added to the staff already employed. Members of the general staff are sometimes sent to other institutions to conduct tests and in 1912, two of them were sent to Ellis Island to conduct an experiment extending over several months. Their aim was, first to find out whether it was possible for trained experts to pick out mental defectives by observation as they passed through the receiving station, and secondly to apply Binet and other tests to the selected cases later, the real object being to find the per cent of mental defectives among the immigrants.

In 1909, there was a rapid development in the field of applied psychology and a number of psychological clinics were established. A new phase of the work was inaugurated by the Juvenile Psychopathic Institute of Chicago. This was founded by private philanthropy for the purpose of conducting research work in connection with the problems of juvenile delinquency. Dr. William Healy, a neurologist who had already had experience as medical examiner for the juvenile court was selected as director and Dr. Grace Fernald as psychological assistant. An arrangement was made with the officials of the juvenile court in accordance with which doubtful cases are sent to the clinic for examination and a diagnosis is made before action is taken by the court. A series of tests used in the clinic have been published by Dr. Healy and Dr. Fernald.

In this same year, 1909, a psychological clinic for the examination of exceptional children was established at Clark University as a department of the Children's Institute. This clinic offered free diagnosis, and advice as to institutions and methods of dealing with the various cases but undertook no treatment or provision for patients during examination if this was prolonged. To some extent, it has coöperated with the public schools, as cases have been brought from the schools for examination and children in the special classes have also been tested.

At about the same time, the universities of Minnesota and Washington introduced clinical work in connection with the departments of psychology and education and, in both cases, this has resulted in the establishment of a permanent clinic. At the University of Washington this has taken the form of an endowed foundation for Child Welfare, known as the Bailey and Babette Gatzert Foundation for Child Welfare, for which $30,000 was bequeathed on the following conditions: "that the said sum of money shall be safely invested

by the trustees in interest bearing securities and the income thereof shall be used to maintain a bureau of child welfare in the department of education of the University of Washington, the work of said bureau to consist in the promotion in various ways of education for the better care and treatment of children suffering from defects either mentally or physically, especially such defective children as can, in spite of their defects, attend school of some sort and benefit by some form of school education and training . . . said bureau to be at all times in charge of a competent expert, and any expense in maintaining the bureau in excess of such income to be provided out of university or other funds."

In 1911, Dr. Stevenson Smith was appointed as director of the Foundation, which ranks as a university professorship. He conducts two clinics which are primarily for the examination of school children, one at the university in connection with the department of orthogenics and one at a public school in connection with the special classes. Individual training and investigation of cases is extensively carried on by students in the department under supervision of the director. Corrective training for children with speech defects is given in daily classes. The Foundation is also affiliated with the juvenile court, its director acting as psychologist of the juvenile court in coöperation with Dr. Merrill, the director of the department of diagnosis of the court. This department investigates every child brought into court on a delinquency charge. He is examined as to his physical and mental condition and as complete an investigation as possible is made of his personal, family, and social history. A detention home affords opportunity for a continued observation of the mental and physical condition of difficult cases.

During the year 1913, 1,186 children were examined at this clinic. In 906 cases, the findings were negative as regards mental or physical defects, 111 were found to be mentally defective. In addition to this there were found 131 cases of functional neurosis, 29 cases of physical precocity, 7 of moral deficiency and two of psychosis.

In answer to questions as to the value of this department of diagnosis to the juvenile court, Judge Frater states that "two years of continuous demonstration has proven its usefulness . . . the scientific study of a child's physical and mental condition prior to the court hearing is of undoubted value, provided the study is made by an educated and experienced diagnostician and the judge presiding in the court is sympathetically interested in his work and knows enough to apply common-sense methods in the adjustment of the various

conditions which scientific inquiry cause to be presented to him."

In the University of Minnesota, a clinic for the study of irregular mental conditions was organized as a section of the psychological department. The medical examinations are in charge of Dr. J. P. Sedgwick of the medical college which coöperates with Dr. Miner and Dr. Woodrow of the psychological department. The work has also had the assistance of Dr. Fred Kuhlmann, who is director of the research work at the Minnesota State School for the Feeble-Minded. Diagnosis of the mental and physical condition of patients is made by the clinic and treatment and methods of training are suggested and carried out under its direction. The clinic coöperates with the juvenile court and Juvenile Protective League of Minneapolis and the public schools.

The university offers a course of three hours a week throughout the year, for the study of mental retardation, which is especially designed for those who are contemplating teaching. In connection with the work of the juvenile court, a valuable collection of case records is being accumulated in which attention is given to the physical, mental, moral, educational and social factors. Two rooms in the court house have been assigned for the use of the clinic and the superintendent of schools and teachers of the ungraded classes coöperate in furnishing data.

More recently psychological clinics have been established at the universities of Pittsburgh and Iowa and some clinical work is done at Cornell and Tulane.

In 1912, the University of Pittsburgh instituted a department of clinical psychology for diagnosis and classification of cases which presented deviations from the normal and for the training of teachers and workers in schools and institutions for mentally defective and backward children. The clinic is under the direction of Dr. J. E. Wallin and is "at the service of parents, teachers, physicians and social workers and schools throughout the state." The university offers five courses in clinical psychology, three extending throughout the entire year and two of one semester each. Supplementary courses in child study and education are given in other departments.

In 1913, a psychological clinic was established in the State University of Iowa as a branch of the psychological laboratory with Dr. R. H. Sylvester as clinical psychologist. It coöperates with the medical school and departments of education. A new feature is introduced by the fact that Dr. Sylvester accepts three day invitations to other cities to examine children and it is hoped that this may pave the way for the

introduction of psychologists as a regular part of the school systems of the state. The clinic will devote special attention to the treatment of speech defects, a line in which Dr. Fletcher of Tulane University and formerly in charge of the Clark Clinic is also an expert.

At Cornell, the educational laboratory under the direction of Dr. Whipple is to test selected cases at the George Junior Republic, which is located within an easily accessible distance from Cornell.

Owing to the difficulty of obtaining appropriations, state institutions for the feeble-minded have been slow in following the example set by Minnesota. Since the work initiated by Dr. Wylie in 1898 no state appointments were made until 1909 when Dr. Edmund Huey* was appointed psychologist at the State Institution for Feeble-Minded at Lincoln, Ill. His clinical studies in the psychology of defectives, published under the title of "Backward and Feeble-Minded Children," is a record of his valuable work during his comparatively brief stay at Lincoln before he was called to Johns Hopkins as assistant in psychiatry at the Phipps Clinic, where a most promising field of work was opening. He was succeeded at Lincoln by Dr. Clara Harrison Towne.

In 1910 Dr. P. F. Lange received an appointment at the Iowa State Institution for the Feeble-Minded and a Psychological Clinic was inaugurated at the Women's Medical College at Philadelphia. In both of these institutions, however, there has been a suspension of the work in consequence of the directors being called to other positions.

Several psychopathic clinics have recently been opened in connection with hospitals but are of too recent date to furnish reports of the work accomplished. The New York Post Graduate Medical School and Hospital established a clinic for the examination of defective children under the name of Clearing House for Defectives, in 1912, of which Dr. Max Schlapp is director and there is also a clinic directed by Dr. Samuel B. Heckman at the Hospital of the City of New York.

A clinic for out-patients is held at the Boston Psychopathic Hospital which has been available for cases brought by social workers and others and Dr. V. V. Anderson, assistant physician at the clinic, has recently been appointed to assist the probation officers of the Municipal Criminal Court.

In a somewhat different field is the development of psychological clinics in connection with reformatory institutions. In 1912 at the Bedford Reformatory for Women, there was established a Bureau of Social Hygiene for the purpose of study-

* Deceased Dec. 30, 1913.

ing the lives and needs of the inmates, who are young women between the ages of sixteen and thirty years. The special problem of this laboratory is the study of the conditions which have led to prostitution and commitment of the girls in the reformatory, in order to prescribe for their treatment and rehabilitation. It has three departments, psychology, sociology and nervous pathology, carried on by an able staff of workers under the direction of Dr. Katharine Bement Davis, Superintendent of the Reformatory since its foundation in 1901, and recently appointed Commissioner of Correction in New York City. This laboratory is financed by the Rockefeller Bureau of Social Hygiene, but even before its establishment, Bedford Reformatory was widely known as an experiment station for the scientific study of the causes and treatment of delinquency among women and girls.

Within the past year, the Board of Trustees of the State Home for Girls at Trenton, N. J., has established a department of psychological research based upon child study. Mental capacity is tested, the history of each girl admitted to the home is obtained as fully as possible, an examination and record of her physical condition made and a diagnosis is based upon these three factors. It is hoped that this may ultimately lead to the weeding out and transference to other institutions of the feeble-minded and those of an insane diathesis, so that the efforts of the home may be entirely devoted to the training of girls of normal mentality.

The Philadelphia House of Detention for Children also has a clinic under the direction of Dr. Walter Cornell and this last year the Preston School of Industry has engaged Mr. Fred. Allen to give Binet and other mental tests to all cases suspected of defective mentality. Although no appropriation has yet been made for a permanent clinic, it is hoped that the work now being done will lead to this in the near future.

Clinical work is also done at the Men's Reformatory in Indiana and mental tests are being systematically given in a number of institutions which have no regular clinic.

In connection with the public schools, the value of the psychological clinic as a part of the school system is beginning to receive recognition. In the spring of 1909 the legislature of California passed a law establishing "Health and Development Supervision" in the public schools of the state. One section of this law provided for "the adjustment of school activities to health and growth needs and development processes of pupils" and another for "the study of mental retardation and deviation of pupils in the schools." Although the law was permissive and not mandatory, eleven cities, of

which Los Angeles was the first, soon established more or less complete health and development supervision under its provisions. The most complete organization is in Los Angeles where the Department of Educational and Clinical Psychology of which Dr. George Leslie is director, has a finely equipped laboratory and receives equal recognition with the School Health Department both as to authority and salaries. One other city, Oakland, has a psychological clinic, which was established somewhat later and is not yet as fully organized as the Los Angeles clinic.

In the fall of 1913, a medico-psychological laboratory was opened in Albany as a part of the system of health direction under Dr. Clinton P. McCord. This has quarters in the city hall in connection with the director's office where all children in or candidates for the special classes are examined before transfer is made. Transfers to and from the special classes are made only by recommendation of the health director. The director is a physician who has had psychological training and was formerly assistant in the Medical Research Department at the Vineland Training School for Feeble-Minded. The form board, Binet, De Sanctis and other tests are used. Teachers of the special classes fill out descriptive blanks and the school nurses assist in securing sociological data. A dental clinic is soon to be added and it is hoped that, as the work expands, a psychologist who will devote his entire time to the mental development side of the work may be included as a regular part of the system.

Rochester, in 1906, began to feel the pressing need of relieving the regular classes from some of the most pronounced cases of subnormality and a special class was formed which was speedily followed by several similar classes in the same year. The relief and benefit to the teachers and normal children was so great that a director was appointed to examine children and organize classes for the care and training of the retarded children. At the same time, a special medical inspector was appointed by the Health Bureau whose work was to study the relation of physical to mental defects. These two officers coöperated in the examination of children by both physical and mental tests. Various tests were at first used and many of them, but the labor of the detailed work soon became so great that in 1909 a Binet examiner was appointed and the Binet scale adopted by the board as a preliminary test. Any child testing three years or more below age is referred to the laboratory as a subject for special study and investigation. At no time has the Binet test been used as conclusive evidence of subnormality, but it furnishes

a most useful instrument for singling out cases for more careful study.

In Hartford, since 1912 Dr. George Dawson, who had previously devoted much time to the study of difficult children in the schools, has held the official position of examiner for one school district, giving two half-days in the week to the work of examining pupils who for any reason appeared to be misfits in the school system. In 1913, he was appointed to do similar work in Springfield, devoting to it one day in the week. Inadequate as is this beginning, the value of the work will probably lead to the recognition of the needs of a psychologist to devote his entire time to this work.

In this connection, it is interesting to note that the London County Council at a meeting of the Education Committee held in June, 1912, appointed a psychologist to examine all pupils recommended by teachers for the special schools. He gives half his time and receives a salary of £300. The appointment is for three years.

Although the psychological clinic is as yet in its infancy, the work already accomplished gives great promise for the future. The clinics already established, though all having as their ultimate aim the welfare of the child, have developed along different lines, each corresponding to a social need. As centres of development, the university, institutions for feeble-minded, juvenile courts and reformatories and the public school have all played their part. In the university, the primary emphasis is naturally more upon the side of research than practical application. In institutions for the feeble-minded, in the public school and in connection with the problems arising from juvenile delinquency, the practical side is the more pressing though until further progress has been made, research must form an important part of the work. The studies of Ayres, Thorndike, and others have shown us the great amount of retardation among the pupils of our public schools and the consequent waste of public money, but the proportion of this which is due to native deficiency and that which is due to remediable causes are still problems to be investigated. For the sake of the teacher, the other pupils and the child himself, actual mental defectives should be removed from the regular classes of the public schools. They are not only a drag upon the progress of the class but take an undue proportion of the teacher's time, frequently exercise a demoralizing influence upon the rest of the class, and not only receive no benefit themselves but lose the opportunity of development for such usefulness as is within their capabilities. Children who under the influence of the training and super-

vision provided by special institutions might become, at least, partially self-supporting and contented members of a community are thus allowed to degenerate and become a menace to society, until some overt act, for which they are not morally responsible, brings them into court and under legal control. In the few cities which have already introduced psychological clinics into the school system, their value has been recognized both as a means of relieving the schools from the feeble-minded and of aiding in the solution of problems arising from difficult cases of misfits in which there is no actual mental defect and sometimes an unusually high degree of mental endowment.

It is at precisely this point that a very real danger should be avoided. The whole subject of mental tests is at present in so unsettled a condition that no one but an expert psychologist with additional clinical training and in conjunction with a medical examiner with experience in work with children should be allowed to make a diagnosis upon which a child's whole future depends. It may be a useful and valuable addition to a teacher's training to acquire the technique of giving the Binet and other tests and such training may be of practical service in helping to grade normal pupils or as corroborative evidence in cases of gross mental defect; but the psychological clinic as a part of the school system should be directed only by experts trained for the work, whose case records, even if they themselves have not time for the analysis and working up of them, will furnish valuable material for scientific research. If it is objected that such experts would be too great a financial burden for the school system, it may be pointed out that the present actual expenditure for repeaters, which might be saved by the elimination of the unfit and adjustment of the misfits through the work of a clinic, would pay the salaries of several experts.

In the juvenile courts and institutions for delinquents, the value of the psychological clinic has already received demonstration. It is obvious that the presence in institutions of morally irresponsible delinquents render the problems of discipline and training almost insoluble. Methods which are most successful with those susceptible to reform are evidently inapplicable to cases where direct restraint is the only means of supplying the control of which they themselves are incapable. It is equally obvious that the best and most economical way of meeting this difficulty is through the winnowing process of the court clinic, by means of which mentally deficient delinquents may be separated from the mentally normal and provided for in institutions suited to their needs.

Here again there is need for research and practical workers to join hands, for the determination of border line cases is a problem in which psychology must as yet admit its inadequacy, and in its solution, the laboratory, the clinic and the social worker must coöperate. Here such work as that of the Bedford laboratory is of the greatest value and the application of tests more or less standardized to reformatory inmates furnishes data for further work. Germany is already making use of the *Beobachtungsanstalt* for determining the treatment of juvenile delinquents, and with the aid of the clinic our detention homes could well be transformed into similar institutions.

In the schools for the feeble-minded, the value of the clinic is twofold for in addition to having the most fruitful field for research, it furnishes practical aid in the classification of the children according to the mental grades and types. From this brief review of the development of psychological clinics it is evident that there is a demand upon universities to furnish courses for the adequate training of specialists in what is rapidly becoming a new profession. Such training should include thorough drill in the scientific methods and technique of the psychological laboratory, courses in general, social, educational and child psychology, special courses in the psychology of defectives and delinquency and practical experience in the technique of giving mental tests. A knowledge of the development of child welfare institutions in the United States and other countries and a general course in sociology should also be included, to give orientation in the broader aspects of the work. While a few universities are beginning this work, there is need not only for an extension of the courses in the university but for organized coöperation with institutions, so that academic training may be supplemented by practice in clinical work and observation of typical cases.

BOOK NOTES

The mental and physical life of school children. By PETER SANDIFORD. London, Longmans, Green & Co., 1913. 346 p.

The purpose of this book is to present a comprehensive account of child nature for the use of students in training colleges, and is based on the author's experience for seven years with students in England and America. It is meant to be a textbook, giving in the smallest space the largest number of facts. Under the child's physical life the author discusses heredity, growth statistics and health. He then considers the physiological basis of mental life, the evolution of the nervous system, its constitution, the functions, the senses. Under dynamic and functional psychology he discusses instincts, capacities, health, habit, association, memory, suggestion, imitation, attention and interest. Under descriptive psychology come perception, imagination and emotions. Then comes the psychology of babyhood and adolescence, the exceptional school-child, and finally, in discussing psychology of a special subject he takes up the problem of language in children. It seems to us the author has very little perspective in his work. His purview, as far as we can see, seems to be limited to English writers and he has a kind of pedagogic encyclopedism that makes anything, from the paramecium to statistical methods, optical illusions or problems in arithmetic, in place. The book is not well printed or bound, but nevertheless has its good points and cannot fail to be suggestive.

The demonstration schools record, number two; edited by J. J. FINDLAY. Manchester, University Press, 1913. 283 p.

This volume is a record of work done in connection with the Fielden demonstration school and is the second in a series begun in 1908. The first volume merely explained what a demonstration school stood for, with a few contributions to the curricula to illustrate how staff and students might get acquainted with pedagogic problems in a concrete way. Since the first report a seminary has been organized which brings the school into contact with university pedagogy. All the discussions and reports of this class are designed to improve the work of the school. The volume contains fifteen papers on such topics as corporate life, with notes on school management, work and motives for working, general review of school pursuits, humanities, essay and syllabus for five classes, arts and crafts (essay and syllabus), hand-writing, with notes on reading and composition, English literature, course in singing, modern languages, natural science, mathematics, arithmetic, plane geometry.

Educational psychology. Volume two. The psychology of learning. By EDWARD L. THORNDIKE. N. Y., Teachers College, Columbia University, 1913. 452 p.

"This volume presents the result of psychological studies of human learning and organizes and interprets them for students' use. It is not a complete summary and criticism of the experimental work in this topic, for such a summary and criticism would be too hetero-

geneous and too complicated by intricacies of method and argument. On the other hand, it is not a dogmatic account of the facts as I myself see and judge them." This volume treats of laws of learning in animals, associative learning in man, learning in man, learning by analysis and selection, mental functions, their development by practice, the amount, rate and limit of improvement, its factors and conditions, changes in rate, permanence of improvement, improvement in informational, associative, analytical and selective functions, and finally, the influence of improvement in one mental function upon the efficiency of other functions, concluding with a bibliography.

School health administration. By Louis W. Rapeer. New York, Teachers College, Columbia University, 1913. 360 p.

This is a dissertation designed to find and show what the American cities are doing for national health and vitality through the agency of the public schools, and how the work may be made more efficient and useful in solving our individual and national health problems. The investigation began with the practice of this work by the author when he was a school principal in Minneapolis, and has been continued by data collected by the Child Hygiene Department of the Russell Sage Foundation. In part one the author discusses national and school health problems and how they are being met; (2) a study of twenty-five cities as to the general phases of health administration, nature and efficiency of the work done, ailments and physical defects of school children, common and non-infectious ailments, communicable troubles, special phases of medical inspection; while part 3 deals with a tentative standard plan of medical examination. The book contains many interesting tables and marks a real contribution to our subject.

Young working girls. A summary of evidence from two thousand social workers. Edited for the National Federation of Settlements by Robert A. Woods and Albert J. Kennedy, its secretaries; with an introduction by Jane Addams, its first president. Boston, Houghton Mifflin Co., 1913. 185 p.

The inquiry which this volume reports was undertaken immediately after the formation of the National Federation of Settlements in 1911, and seeks to bring together the results of settlement experience in specific directions. The baffling problem of the adolescent girl of the tenement house, city factory and department store is keenly felt. The chief topics considered are, preparation for industry, entrance upon it, new attitudes toward home and neighborhood, inadequate home life, a better family setting, morality of sex, recreation and character, forms of constructive recreation, elements of good club work, mixed clubs of boys and girls, education in realities, preparation for womanhood, a provisional platform.

Medical and sanitary inspection of schools, for the health officers, the physician, the nurse and the teacher. By S. W. Newmayer. Ill. with 71 engravings and 14 full-page plates. Philadelphia, Lea & Febiger, 1913. 318 p.

This volume represents an effort to prepare for physicians, nurses and teachers a guide to the physical examination of school children. The author aims not only to outline a plan of what and how such work can be best performed, but also to develop a deeper appreciation of the relations of physical and mental development. Medical

inspection of schools has far more than justified its existence. The work is divided into four parts, (1) administration, (2) school buildings and grounds, (3) infectious, contagious, and communicable diseases, (4) physical defects. The book is quite copiously illustrated and is also very practical in that it gives directions about passing examinations and testing mentally defective children, etc.

De la méthode littéraire; journal d'un Professeur dans une Classe de Première. Par J. BEZARD. Paris, Librairie Vuibert, n. d. 2nd ed. 746 p.

In the first part, under the title, the origins of classic reason, the author discusses the nascent ambitions of science and the limits imposed to it by Pascal. In the second part, entitled the classic spirit in the 18th century, he discusses the arts of observation, composing and writing. Under the third part, entitled the processes of reason in society, he gives us 16 interesting chapters on prominent men and literary movements. In the fourth part, entitled romanticism and evolution, he discusses the errors of classic reason, the origin of romanticism, Rousseau, first symptoms of the revolution, and romanticism as its result. The fifth part takes up romanticism and realism, discussing the romantic elegy and drama, the literature of to-day, science and poetry, history, relations of romance to the theatre. The points of view represented by the author are original, his book is interesting, and one is inclined to wonder whether its translation into English would not be a profitable venture.

Foods and household management; a textbook of the household arts. By HELEN KINNE and ANNA M. COOLEY. N. Y., Macmillan, 1914. 401 p.

This volume, like its companion, "Shelter and Clothing," is intended for the course in household arts in high and normal schools, whether the work be vocational or general. It treats specifically of foods, their preparation, sanitation, cost, nutritive value, serving,—these topics being interwoven with the practical aspects of household management, and followed by a study of budget accounts, methods of buying, housewifery, with 160 recipes, many cooking exercises, designed to develop initiative and resourcefulness just as "Shelter and Clothing" deals with the organization and ideals of the home, household sanitation and decoration, furnishing, and treats in full textiles, sewing, costume designing and dressmaking. This volume contains about 80 cuts.

The Montessori method and the American school. By FLORENCE ELIZABETH WARD. N. Y., Macmillan, 1913. 243 p.

The author's aim is to offer those who have practical interest in its intimate details some of the impressions received from an investigation of the Montessori method at first hand, as well as some results of experiments made among children with whom the author works daily. These talks are epitomes of discussions conducted with classes. Generally reforms come slowly, but the Montessori movement seems likely to be an exception. Thus the author first treats the evolution of the method, her impressions, freedom, the basal principle, the child's world of objects, the language, oral and written, practical developments, mediums of self-expression, oldest agency of early education, the home, other articles on early education, etc.

Advanced English grammar. By WILLIAM T. HARRIS. Yonkers-on-Hudson, World Book Co., 1912. 511 p.

In preparing this treatise, the author desired to make this most useful branch of study both pleasant and effective by a systematic, orderly presentation, and we are assured that the work is in strict accordance with the best pedagogical thought and practice. The inductive method is employed, and the student is called on to cultivate the power of thoughtful observation. He has to see, to know, to do, and is thrown upon his own resources. The book as it stands certainly needs explanation. We are left to infer that the author is William T. Harris, late head of the Bureau of Education, but the writer of this note has no knowledge that he ever devoted any such special attention to this subject. Moreover, the book here appears with no intimation that the author died some years ago.

Hygiene for girls; individual and community. By FLORENCE HARVEY RICHARDS. Boston, D. C. Heath & Co., 1913. 257 p.

The author thinks modern text-books on physiology contain too much physiology and not enough practical hygiene, and seeks to remedy this error. First comes individual hygiene, of muscles, bones, excretions, circulation, digestion, respiration, nerves, with a few experiments; second, community hygiene, dealing with germ diseases, tuberculosis, vaccination, anti-toxine, narcotics, alcohol, patent medicines, public works, emergencies; with a final part on the reproductive system, with sex hygiene. The book is copiously illustrated with over 150 well chosen cuts, and is an admirable specimen of judiciousness in selection and of condensation in the presentation of the themes.

Young boys and boarding school; the functions, organization and administration of the sub-preparatory boarding-school for boys. By HORACE HOLDEN. Boston, Richard G. Badger, 1913. 197 p.

This book is based on a thesis in 1909, required in the graduate course at Harvard, although it is here developed and matured. The author discusses first the lower school, and then gives a chapter each to the boy from seven to fourteen, physical, intellectual, moral, social education, the day's work, the curriculum, personnel of the staff, location and equipment, the economics of the school, and special problems in it. It is an interesting, up-to-date and practical book. The author has availed himself pretty well of most of the sources of information upon the subject he treats in English but does not appear to have gone much outside.

Psychologie der Sprachpädagogik; Versuche zu einer Darstellung der Prinzipien des fremdsprachlichen Unterrichts auf Grund der psychologischen Natur der Sprache. Von. CHR. B. FLAGSTAD. Leipzig, B. G. Teubner, 1913. 370 p.

The first chapter, on the reconstruction of words, discusses the nature of the apprehension of sound, then of the language sounds. The second section takes up the enlargement of the natural word ideas, then comes the consideration of the development of language as an expression of a mental content, and here first the speech mechanism, then the form and content, then the word structure is discussed. Third comes the relation of language to the whole psychic life, the relations of the word to other conscious content and ideas, the significance of the life of feeling in language, and the work closes with a consideration of the will and the development of speech.

Principles of education. By T. RAYMONT. London, Longmans, Green, 1913. 381 p.

The writer here treats, first, the machinery, second, the object, third the means of education, the latter including the choice of studies, scope of the school, some maxims of methodical procedure, origins of studies and sequences of lessons, correlation of studies, processes and devices of teaching, influence of public examinations, etc. The last or fifth part, on the means of education, discusses the problems of teaching, the authority and influence of the teacher, and the influence of school on society.

Young folks handbook. Philadelphia, American Institute of Child Life, 1913. 215 p.

The American Institute of Child Life, which has developed from the After School Club, is passing through an interesting if not critical stage of its existence. With the advent of Dr. Byron Forbush as its head, its scope became enlarged, its aim elevated, and without doubt its usefulness increased. The monographs now appearing under his editorship are most of them admirably calculated to be of practical service to parents, teachers and child workers. We sincerely hope that the Institute will not be tainted with commercialism.

Intensive studies in American literature. By ALMA BLOUNT. New York, Macmillan, 1914. 331 p.

The topics here discussed are, what literature is, forms of poetry, meter, stanza, rhyme, kinds of poetry, melody and harmony, the sentence, loose, periodic and inverted, diction, figures of speech, and various qualities of style and kinds of writing. Part two, intensive studies, beginning page 101, takes up selections from Irving, Bryant, Poe, Wadsworth, Longfellow, Whittier, Lowell, Holmes, Lanier, Walt Whitman and Emerson. There are 19 full page illustrations in the text.

Chinese womanhood. By LUCINDA PEARL BOGGS. Cincinnati, Jennings & Graham, 1913. 129 p.

The author, a Ph. D. of the University of Illinois in psychology and education, has lately spent some time in China and sets down the results of her thoughts and observations on womanhood, the mother, the wife, the priestess, illustrious women of China, education of women, Western civilization and Chinese women.

The marking system in theory and practice. By I. E. FINKELSTEIN. (Educational Psychology Monographs, no. 10.) Baltimore, Warwick & York, 1913. 88 p.

This is an interesting study of marks at Cornell in 1902-03 and 1911, discussing distribution, variations by change of instructor, typical distribution of high and low marks, peculiarities of distribution of other causes, the marking system in the college of law, etc., all illustrated with 20 diagrams.

The examination of school children; a manual of directions and norms. By WILLIAM HENRY PYLE. New York, Macmillan, 1913. 70 p.

The object of this manual is to provide in finished form for teachers directions for the examination of school children and a table of

norms for various ages. No originality is claimed for the tests. It is a very convenient and condensed paper.

Elements of debating. By LEVERETT S. LYON. Chicago, University of Chicago Press, 1913. 136 p.

This book attempts no originality but presents the elements of forensics largely freed from technicalities for the benefit of high school and college beginners. It characterizes and defines argument, debate, the requisites of success, making and proving the issue, the brief, refutation, management of the debate, how and where to read, a typical college forensic, material.

Paedologisch Jaarboek, volume 8. Edited by M. C. SCHUYTEN. Paris, Librairie C. Reinwald, 1913.

This volume contains nine important articles and some scores of reviews and shorter articles, with a very full bibliography. It is a pity that at least an epitome of the articles could not be published in English, French, or German.

A cyclopedia of education. Volume 5. Edited by PAUL MONROE. N. Y., Macmillan, 1913. 892 p.

Professor Monroe is to be congratulated on bringing this important work to a close with this fifth volume, which will long remain unique in English pedagogical literature. It is a work to which every teacher ought to have access and to which all thinking teachers will.

Die Erkennung des Schwachsinns beim Kinde. Von EMIL VILLIGER. Leipzig, Wilhelm Engelmann, 1913. 90 p.

The French verb; its forms and tense uses. By WILLIAM A. NITZE and ERNEST H. WILKINS. Chicago, University of Chicago Press, 1914. 40 p. (With French verb blanks.)

Trans-Atlantic historical solidarity. Lectures delivered before the University of Oxford in Easter and Trinity terms, 1913. By CHARLES FRANCIS ADAMS. Oxford, Clarendon Press, 1913. 184 p.

Linking the life insurance companies to the public health movement. By EUGENE LYMAN FISK. (Read before the Reed College Conference on Conservation of Human Life, Portland, Ore., May 9, 1913.) 8 p.

Concrete investigation of the material of English spelling; with conclusions bearing on the problem of teaching spelling. By W. FRANKLIN JONES. Vermillion, S. D., University of South Dakota. 27 p.

Panama canal; what it is and what it means. By JOHN BARRETT. Washington, D. C., Pan American Union, 1913. 120 p.

The Pan American Union; peace, friendship, commerce. By JOHN BARRETT, 1911. 253 p.

Table talk in the home. By the Literary staff of the institute. Monograph of the American Institute of Child Life. Philadelphia, 1913. 16 p.

Calendar of childhood and youth. Prepared by William Byron Forbush and the educational staff of the American Institute of Child Life. Philadelphia, American Institute of Child Life, 1913. 59 p.

Theodate Louise Smith

It is the painful duty of the editors of this Journal to announce the death of Dr. Theodate L. Smith, Librarian of the Children's Institute at Clark University, and a frequent and able contributor to the PEDAGOGICAL SEMINARY. Dr. Smith was actively engaged in her work and apparently in her usual health until February 15th, and died on February 16th. This is not the place to give any extended account of her life and character; but this Journal wishes to acknowledge its great indebtedness to her and to express its appreciation of her extended services in the cause of child welfare.

Dr. Smith was born in Hallowell, Maine, April 9, 1860; had received the A. B. and A. M. degrees from Smith College; the Ph.D. degree from Yale; and was a student at Clark University, 1895-96; research assistant to President Hall from 1902 to 1909; and since that date Lecturer and Librarian in the Children's Institute.

In connection with her work in the Children's Institute Dr. Smith had collected a large and valuable mass of material in regard to child welfare institutions of various kinds; and she placed this and her own extended knowledge at the service of everyone. Her devotion to the study of children was only surpassed perhaps by her love for the individual children of her acquaintance.

As a scholar, thoroughgoing and widely read; as a psychologist and student of childhood, sane and conservative; as a teacher, clear and straightforward; as a colleague, modest, helpful and generous; one did not always realize the scope of her accomplishments on account of the fact that her training was so well balanced. Dr. Smith was not only a thorough scholar, an expert in child welfare, a writer of ability and an efficient worker, but a woman of great poise, commonsense, and an embodiment of the sturdy virtues of the native New England type. Without hair-brained enthusiasm of the reformer as such, or the truculent militancy of the volunteer, she had the virtues of the professional soldier and was ready not only at any time to respond to any call to attack any strategic point, but also to perform the routine work of garrison duty day after day, and week after week. In this continued service she rendered aid to research students, teachers, mothers, child welfare workers, and indirectly to children; and literally, those who knew her; and figuratively those who had profited by her services, but did not know her, mourn her loss as irreparable. Any extended eulogy of such a worker seems both unnecessary and unbecoming; but the PEDAGOGICAL SEMINARY hopes to print later a bibliography of Dr. Smith's published writings.